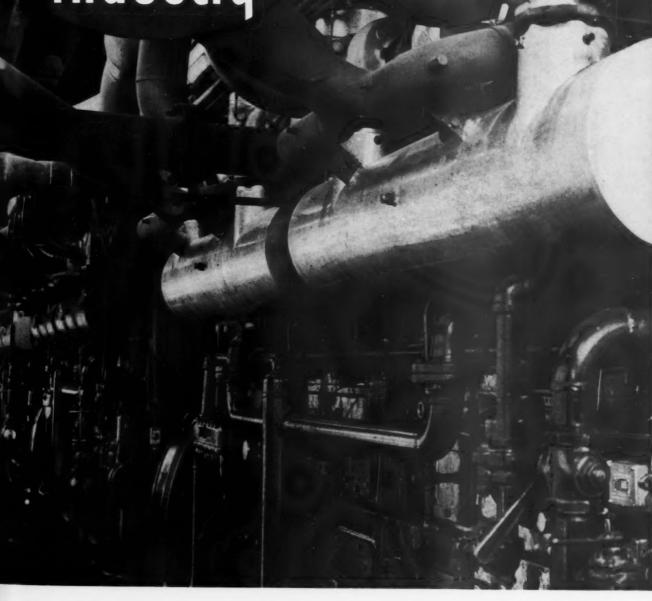
western industry





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IN INEXPENSIVE WAY

rcial: TRANSPORTATION & SHIPPING
CURRENT TECHNICAL MANUALS

STANDARD ENGINEER'S FIELD REPORT

PRODUCT Chevron Cutting Oil TNC

Experimental Specialties Co.

FIRM El Segundo, Calif.

Mills titanium to .0025" tolerances



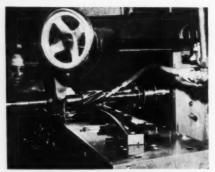
Chevron Cutting Oil TNC protects carbide tool (above) as it cuts slat-track contour from titanium vanadium alloy with Rockwell hardness of 68! This Sunstran rise and fall tracer-control milling machine makes missile and aircraft parts at Experimental Specialties Co. Chevron Oil's extreme pressure additives help machine maintain tolerances of plus or minus .0025", holding rejects to minimum. Reports firm's president, Harry McKillip: "Chevron Cutting Oil TNC is the most economical and efficient general purpose cutting oil I've found in 30 years in this business. Only TNC does the job for us on aluminum, brass, Dural, HYTUF and titanium."



For Expert Help on lubrication or fuel problems; call your Standard Engineer or Representative, or write to 225 Bush St., San Francisco 20, California.



End milling on titanium piece is done by Cincinnati rise and fall camcontrol machine which cuts slot-like track. Jobs run from 50 to 1000 duplicate parts. Titanium alloy in use has sufficient hardness to destroy file teeth.



Fritz-Werner Horizontal Milling Machine mills flat parallel surfaces of slat-track. Firm reports all-purpose Chevron Cutting Oil TNC, used in 40 pieces of shop equipment, eliminates need to change oil when working different materials.

Why Chevron Cutting Oil TNC solves metal-cutting problems



- Will not etch or corrode machine parts
- Extends tool life, assures precision finishes
- Flushes away cuttings readily
- High-cooling and lubricating qualities, very stable

TRADEMARK "CHEVRON" AND CHEVRON DESIGN REG, U.S. PAT, OFF.

STANDARD OIL COMPANY OF CALIFORNIA

. . . for more details, circle No. 1 on Reader Service Postcard

Steel and aluminum users report increased values from Ryerson

These case histories—selected at random from our files, provide additional evidence that you consistently get increased value for your purchasing dollar from Ryerson. Individual points of difference between Ryerson and other sources may not by themselves seem overwhelming—but in total they add up to an important difference in dependability, experience and capacity to serve.

A world famous manufacturer formerly tested all steel purchased from steel-service centers for critical ordnance work. But, often, test costs on small lots of steel were greater than material costs. So the company decided to concentrate its purchases with sources proved completely reliable—and discontinue its own testing. Experience showed that the required certifications of quality were always absolutely dependable in the case of only three steel suppliers—among them Ryerson where quality has been a watchword since 1842.

Milling operation eliminated. A structural fabricator followed the usual practice of milling the ends of beams to be used as column bases until he discovered the accuracy and squareness of Ryerson friction sawing. Now he has eliminated the milling operation because, at no extra cost, Ryerson can guarantee friction saw accuracy of only $\pm~1/16''$ for beams up to 6'' and $\pm~1/8''$ for sections over 6''—squareness tolerances of .010" per inch of section.

Better product appearance and a worthwhile saving in material cost resulted when a Ryerson man recommended that a producer of portable coolers switch from one aluminum alloy (3003-H14) to another (5005-H14). Slightly higher structural strength was a bonus value. Unusually broad aluminum stocks and technical resources often enable Ryerson to serve in this way.

The need was urgent. A breakdown was cutting output of a big paint producer, and the steel needed to repair the break was not available in the area. However, the required analyses and size was on hand at the nearest Ryerson plant 200 miles away—and within an hour Ryerson delivered 100' of this bar stock to the local airport. Three and a half hours after calling Ryerson in another state, the customer had his steel.

"Deeper cut, better finish, longer tool life, and lower total per-piece cost." These were the results reported by a Mass. machining company after it switched to Ryerson Rycut® 40 alloy steel for shafts, gears and spindles used in rugged machine tools. Ryerson Rycut steels are the world's fastest machining in their carbon ranges.

Missile component problem solved. Titanium stringers in stainless forged bars were creating a high reject rate for a missile parts manufacturer. His Ryerson specialist recommended a switch from Type 321 stainless to Type 347. Results: the same stabilized corrosion-resistance and strength—but no titanium stringers.

Furniture manufacturer saves 15¢ per unit on every chair produced. A rolled aluminum angle was being used where strength was not an important factor. A Ryerson aluminum specialist suggested an extruded angle which gave all the strength needed in the application, was more easily formed, had better appearance—and reduced costs as well.

These are just a few examples that illustrate the advantages that make Ryerson service truly unique. A call to your Ryerson representative may solve similar problems for you.



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 Bank of natural gas engines. Engine in foreground has four turbochargers installed to boost power output.
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NEW MONARCH DEVELOPMENTS STOP PREMATURE RIM SEPARATION!



MONARCH SOLIDS FEATURE NEW COMPOUND AND BONDING PROCESS ... REDUCE REPLACEMENT COSTS

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MONARCH engineers have solved this problem by combining a new, extra tough, natural rubber stock, Compound T-5100, with an advanced rubber-to-metal chemical bonding process. Extensive field tests have proven that MONARCH tires now feature unprecedented resistance to rim separation caused by the above factors.

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WESTERN INDUSTRY/DECEMBER 1959

5



AERIAL VIEW OF NEW Campbell Chain Company plant at Alvarado, California. This modern factory manufactures a complete line of welded and weldless chain for West Coast users.

Complete Chain Making Facilities Now, for the First Time on West Coast

Campbell Chain Company's modern new plant at Alvarado, California, serves 11-state area

I MPORTANT NEWS to users of chain is the Campbell Chain Company's new factory and offices now in operation at Alvarado, California.

The new plant speeds delivery of chain to Western industrial, commercial and automotive markets, making possible same-day or overnight shipment of Campbell Chain's complete line of products. The plant also supplies Campbell warehouses in Portland, Seattle, and Los Angeles.

The new Alvarado factory is the most modern plant of its kind in the country. The efficiently designed, one-story building covers over 130,000 square feet of office and manufacturing facilities. It provides all the advantages of completely integrated, straight-line production.

Equipment includes the latest in

heat-treating and annealing furnaces and the most modern wire-drawing, forming and welding machinery. The factory has complete facilities for metallurgical and product testing.

The Alvarado plant marks a major development in the expansion of Campbell Chain Company, adding to manufacturing facilities at York, Pa., and West Burlington, Iowa, and warehouses across the nation.

New Campbell Plant Produces Hundreds of Types of Welded and Weldless Chain and Assemblies



PROOF COIL, BBB COIL, HIGH TEST STEEL CHAIN AND CAM-ALLOY: These grades represent the strongest electric welded chains manufactured by Campbell. Proof and BBB are made from open-hearth basic steel, High Test from high-carbon steel and Cam-Alloy from special analysis Alloy Steel. Each grade is designed for specific uses. Eleven or more sizes of each grade are available.



STRAIGHT LINK MACHINE CHAIN: This is a general utility chain, manufactured from low carbon steel. Characterized by short narrow links. Supplied in many finishes and in twelve sizes.



TWIST LINK MACHINE CHAIN: Same original link as Straight Link Machine Chain; however, each link is given a 90° twist. Chain will lie flat. Twelve sizes available in variety of finishes.



STRAIGHT LINK COIL CHAIN: A long straight link of low carbon steel. Used for general utility purposes and supplied in all standard finishes and in twelve sizes.



TWIST LINK COIL CHAIN: Same original link as straight link coil chain, then given 90° twist. Will lie flat. Supplied in many finishes and in twelve sizes.



PASSING LINK CHAIN: A general purpose chain made of low carbon steel. Links can pass one another freely, eliminating kinking. Available in all standard finishes and in three sizes.



WELDED CHAIN ASSEMBLIES: All grades of welded chain are available with a variety of attachments for specific uses, such as Log Chains, Boomer Chains, Anchor Chains, Winch Line Chains and Binding Chains.



SLING CHAINS are available in many grades and styles with a full assortment of attachments. Guaranteed for a full year.



INCO COIL CHAIN: The most popular formed wire chain used on the farm, in the playground, in the boat and has many other general applications. Made of mild steel in three finishes and in fifteen sizes.



LOCK LINK PATTERN COIL CHAIN: The sprocket wheel or overhead door chain that has many other general utility uses. Made of mild steel. Eleven sizes, three finishes.



SINGLE JACK CHAIN: Available in mild steel or brass. Used for fixture suspension and where high strength is not necessory. Available in eight finishes, twelve sizes.



DOUBLE JACK CHAIN: For children's toys or ornamental purposes. Good for light utility applications. Steel or brass, nine sizes, six finishes.



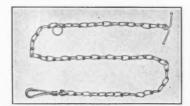
SAFETY PLUMBERS CHAIN: A flat stamped link in brass or steel, used for plumbing fixtures or applications requiring light, flat chain. Six finishes, four sizes.

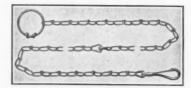


LADDER SPROCKET CHAIN: The Sprocket wheel drive chain for small light mechanisms. Can be made of brass or various types of steel. Usual finish, bright. Five sizes.



SASH CHAIN: Flat stamped link that operates smoothly over pulleys. Made of bronze or mild steel. Eight finishes, nine sizes.





WELDLESS CHAIN ASSEMBLIES: All weldless chain grades are available in a variety of factory made assemblies. Tie-Out Chains, Kennel Chains, Halter and Dog Chains, Cow Ties, Dog Runner Chains, Hammock Chains are popular examples. All necessary accessories such as "S" Hooks, swivel snaps, rings and swivels are also available.

TIRE CHAINS AND ACCESSORIES



PASSENGER CAR, TRUCK AND BUS TIRE CHAIN: Campbell manufactures tire chains for every vehicle from garden tractors to earth moving equipment. Most sizes are available in three types: Lug Reinforced for maximum traction and long wear, Highway Service for general use, and Mud Service for off-the-road use. Campbell also manufactures New Jiffy tire chains for passenger cars . . . the chains that go on the wheel in less than a minutel Tow Chains, Adjusters, Engine Slings, Emergency Chains and Repair Links are also available from Campbell in Alvarado.

CAMPBELL CHAIN COMPANY York, Pa.—W. Burlington, Iowa—Alvarado, Calif.

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Alan Wood Super Diamond floor plate ... is easy to bend

The arrangement of the exclusive A. W. Super Diamond pattern lets you bend this flooring at any place on the plate. Form this heavy duty floor plate to fit steps, ramps and walkways . . . it bends readily.

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WESTERN INDUSTRY/DECEMBER 1959

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Here's an adjustable speed drive that allows *truly* precise machine operation. Speed regulation is automatic and stepless — results in faster, more efficient production at lower cost, with less waste, and minimum wear on equipment.

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This improved drive requires minimum maintenance. Its stationary field has no brushes, commutators, or slip rings to cause trouble. The source of power is an equally trouble-free standard a-c squirrel cage motor.

®Ajusto-Spede is a registered trademark of the Eaton Mfg. Co.

The cast-iron housing keeps out dirt, chips, and moisture — resists corrosion.

The compact Ajusto-Spede also saves space. Integrally-mounted motor and drive simplify handling — can be easily adapted for installation on new or existing machines. Controls can be mounted at the machine or any other convenient position.

The Louis Allis Ajusto-Spede drive is the practical solution to almost every application that requires dependable, easily controlled adjustable speed. It is the answer to precise operating speeds for machine tools, process machinery, test equipment, windups, conveyors, printing presses, and other equipment. Contact your Louis Allis District Office for information and application help. Or write for bulletins 2750 and 2800 — The Louis Allis Co., 438 E. Stewart St. Milwaukee 1, Wis.

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MANUFACTURER OF ELECTRIC MOTORS AND ADJUSTABLE SPEED DRIVES



New Metals for Space Discussed

AT ITS NOVEMBER 19 meeting feature topic of the L. A. Chapter of American Society for Metals was new metals for structural applications in aerospace vehicles. Feature speaker was Roger J. Runck, manager of the Defense Metals Information Center. He described some of the major developments in new light-weight and refractory metals, their characteristics and promising alloys of these metals. Among the metals discussed were Beryllium, Rhenium and the refractory metals of Group IVa, Va and VIa of the Periodic Chart. While production of these metals is a small part of total production of metals in general, requirements for them and their alloys have stimulated major research and development efforts.

Beryllium, because of outstanding rigidity and light weight, may make possible longer range missiles. The same metal, because of its outstanding ability to absorb heat, may be used in the nose cone of the first manned satellite. New High-Strength, as well as High-Temperature, Titanium alloys are being developed for use in the newer generation of missiles. Columbium and Molybdenum alloys may form the structural parts of Boost-Glide and re-entry vehicles from space. Tungsten, because of its unusually high melting point, may line the nozzles of solid propellant rocket motors. Alloy development work with all of these metals promises newer and better materials for future applications.

Manufacturers Association Selects New Officers and Directors

THE CALIFORNIA MANUFACTURERS Association has elected as its president, William M. Hogue, president, Larsen-Hogue Electric Co. Also elected as vice presidents of the association are P. S. Magruder, executive vice president, General Petroleum Corp., and Walter J. Maytham, executive vice president, Westinghouse Electric Corp. George S. Wheaton, vice president, American Potash and Chemical Corp., has been re-elected association treasurer and S. V. Saginor, vice president, Gladding, McBean and Co., has been elected secretary.

Eight industrial executives have been selected to serve a four year term on the association's 32-man Board of Directors. They are: Ernest F. Blackwelder, President, Blackwelder Manufacturing Co.; George A. Davidson, Vice President, Standard Oil Co.; William R. Hewlett, Executive Vice President, Hewlett-Packard Co.; K. L. Morrow, General Manager, United States Plywood Corp.; R. H. Biron, Vice President, Convair, A Division of General Dynamics Corp.; S. A. Halgren, Vice President, Carnation Co.;

Robert W. Maney, Vice President and General Manager, Goodyear Tire and Rubber Co. of California; Kenneth N. Scott, Plant Manager, B-O-P Assembly Division, General Motors Corp.

Material Handling Meeting

AT THE NOVEMBER 12 meeting of the Los Angeles Chapter of the American Material Handling Society, one of the visitors was Stephen C. Traudt, national president of AMHS. Addressing the evening meeting at Rodger Young Auditorium, Traudt told AMHS members and guests of the importance of harmonious relationship between labor and management in materials handling concerns.



BOB STEPHENSON of Ready Power Tool Co. (right) hands a guest card to visitor Frank Pieper, MH engineer now with Hughes Aircraft Co., but a former member of the board of directors, North Texas Materials Handling Society.

The proper role of material handling management is to interpret the needs and problems of the firm so the worker will both understand them and cooperate in solving them, Traudt pointed out. Good labor-management relations provide willing workers who accomplish more and are involved in fewer disputes, he said.

Another guest present at the meeting was Frank Pieper, material handling engineer currently with the Ground System Division, Hughes Aircraft Co., El Segundo. Pieper is known for his MH work done at Convair in Ft. Worth, Texas, and is a former member of the board of directors, North Texas Materials Handling Society.

New Director of Strategic Industries Ass'n

JEFF FUNK of Sherman Oaks, California, has been named acting executive director of Strategic Industries Association following the resignation of David G. Saunders. Funk, who was named as assistant executive director in May this year, has an extensive background in association and industrial activities. He was manager of the domestic trade department of the Los Angeles Chamber of Commerce for four years and manager of marketing and economic research for Rexall Realty Corp. for more than two years.

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NEW Yale Warehouser builds profits 3 ways

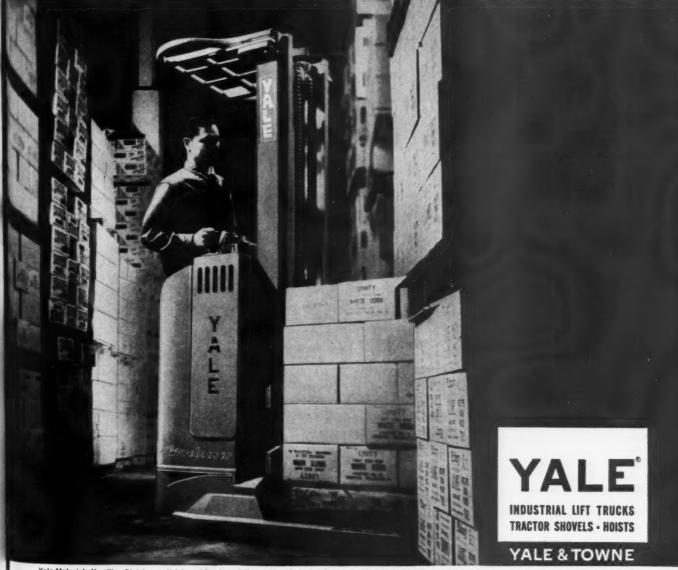
(1) 24-volt system speeds operation cycles (2) Advanced design increases operator efficiency (3) Rugged construction means more time on the job



There's more power in the new Yale Warehouser! 24-volt battery provides faster lift and travel! Faster operation cycles! And your operator will be less fatigued at the end of the day. He has comfortably positioned, easy-to-operate controls! This precision control plus increased visibility protects against product damage.

Your new Yale Warehouser will spend more time on the job! More days on the job! Operational maintenance is minimized because all components are in one fully-accessible compartment. More years on the job! Durable construction! Service access doors protected against bumps—no sprung doors. Frame, chassis, outriggers and channels are a single welded unit.

This new Yale narrow aisle truck is available in straddle and Extend-A-Fork models—in capacities of 2,000, 3,000 and 4,000 lbs. Standard 12-volt models also available. The new Warehouser takes its place as part of Yale's complete line of industrial lift trucks and hoists—gives equally efficient performance in the warehouse or as part of a fleet. Contact your Yale representative or write for brochure #1535H to The Yale & Towne Mfg. Co., Yale Materials Handling Division, Phila. 15, Pa., Dept. RT 1-H.



Yale Materials Handling Division, a division of The Yale & Towne Manufacturing Company. Manufacturing Plants: Philadelphia, Pa., San Leandro, Calif., Forrest City, Ark. Products: Gasoline, Electric, Diesel and LP-Gas Industrial Lift Trucks • Worksavers • Warehousers • Hand Trucks • Industrial Tractor Shovels • Hand, Air and Electric Hoists

(continued)

Western Packaging Association Hears of Russian Packaging Design

FEATURE SPEAKER at the November Western Packaging Association Meeting in San Francisco was industrial designer Walter Landor, who reported on a recent visit to Russia during which he spent some time studying Russian



SOVIET CIGARETTE package design. Note economical soft pack at top and expensive hard pack, bottom. Popular priced brand shows famous dog, Laika, and Sputnik; expensive brand has restraint and shows luxury.

packaging design. According to Landor, package design does exist in Russia despite the fact that the government need make no effort in this direction beyond utility packaging. Most of the better package designs can be found in the so called luxury goods such as cigarettes and candy.

Iron & Steel Institute Has Regional Technical Meeting in San Francisco

THE AMERICAN Iron and Steel Institute held a Regional Technical Meeting, November 6, in San Francisco at the Hotel Mark Hopkins. Presiding at the morning meeting was H. H. Fuller, vice president, Bethlehem Steel Co. Also present was Max D. Howell, executive vice president, American Iron and Steel Institute.

In the morning session D. J. Russell, president, Southern Pacific Co., discussed the West's great industrial growth. He described some of the growth already accomplished in the 11 Western states and stated that the greatest period of development still lies ahead. Pointing to the time when the West reaches industrial maturity, Russell explained he meant when we shall be producing most of the primary products used in our own manufacturing.

Also speaking in the morning session was Dr. Frederick E. Terman, vice president and provost, Stanford University. Dr. Terman told how education is a stimulant to industry. He pointed out that in growth industries, a nearness to a source of brainpower is more important than nearness to

markets, raw material, transportation or labor. The growth of such industries is usually the result of new products made possible by recent developments in science and requires a very large number of highly trained specialists.

J. J. Martin, vice president of Operations, The Colorado Fuel and Iron Corporation, presided over the afternoon session. At that time W. J. Bolton, general manager, Seattle Plant, Bethlehem Steel Corp., told how that plant had been converted from open hearths to electric-arc furnaces without interrupting steel production, an expansion program which required two years and was completed early this year.

J. J. Tredennick, metallurgist, Iron and Steel Division, Fontana, Kaiser Steel Corp., discussed the rapid development of steelmaking techniques by the basic oxygen process, which at Fontana has increased the production rate of a single furnace from 64 to 103 tons per hour. He described the basic oxygen furnaces in use at Fontana, operational methods and improved results derived in a few months of experience.

H. H. Hartman, research engineer, The Colorado Fuel and Iron Corporation, told of an investigation of steel in ingot form to determine if ingot defects are carried through to the semifinished product. The conclusion reached is that most ingot defects are carried through.

William O. Blattner, senior industrial engineer, Pittsburg Works, Columbia-Geneva Steel Division, United States Steel Corp., also spoke on the use of electronic computers. He discussed the solving of operating problems using electronic computers.

New Plant Engineers Chapter in Pasadena

SIXTEEN ENGINEERS from the Pasadena area have formed a new chapter of the American Institute of Plant Engineers. The 51st chapter of AIPE, it will be called the Rose Bowl Chapter.

Bert P. LaForge, superintendent of buildings and equipment, Consolidated Electrodynamics Corp., has been elected president. Other officers include Donald D. Daley, assistant to the superintendent of buildings and equipment. Consolidated Electrodynamics, vice president; Charles R. Martina, plant engineer, Hycon Mfg. Co., secretary; T. Gordon Meikle, director of plant engineering services, Jet Propulsion Laboratories, treas-

Attending the meeting were James Weeks, AIPE



NEW PRESIDENT of new chapter, Bert P. LaForge has been elected president of new Rose Bowl Chapter of American Institute of Plant Engineers.

vice president, who installed the new officers, Richard H. Morris, first national president of AIPE, Thomas H. Hardgrove, past president of the Los Angeles Chapter and members of the L. A. and Orange County Chapters.

. . . continued on page 16



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- Stock is maintained on all widely used types, permitting Jeffrey to make fast shipment.

Standard conveyors are made in mild or abrasive resistant steels. Where heat-resistance or corrosion-resistance is required, you can select Jeffrey spirals in stainless steel, brass, Monel, aluminum, or other special metals.

With Jeffrey spiral conveyors you get a complete selection plus extras in quality—precision fit, smooth flight surfaces and non-toxic protective coating. For full information write for Catalog 951. The Jeffrey Manufacturing Company, 920 North Fourth Street, Columbus 16, Ohio.



Centrifuge cake ranging from 62 to 67 per cent solids are transferred to a mixer by a 16" diameter Jeffrey Spiral Conveyor at the lime reclaiming plant of the City of Lansing, Michigan.



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(Continued)

American Steel Warehouse Association Changes Name at Convention

NEW NAME for the American Steel Warehouse Association is Steel Service Center Institute. At its annual meeting at Pebble Beach on November 18-20 members of the organization voted on and approved the new name in a special meeting. The name change was announced to the membership at its November 19 Business Meeting by executive vice president Robert G. Welch who stated "Steel Service Center Institute reflects more accurately the functional scope and technical competence of our industry."



J. L. ASHBY, president, Kaiser Steel talks to Steel Service Center Institute members at their fourth annual Pacific Coast Regional Meeting. Also shown seated left to right are Russ Rising, Southern California Chapter Chairman, W. T. Williamson, Pacific Northwest Chapter Chairman, and Robert Welsh, executive vice president SSCI

Among the feature speakers were Jack L. Ashby, president, Kaiser Steel Corporation, who discussed the steel strike and explained Kaiser's action in making a separate contract agreement with the union. Robert G. Welch, executive vice president, Steel Service Center Institute talked on foreign steel in the United States, linking it to a great change which is now taking place in the world markets.

Purchasing Agents Expect 3,000 Attendance

OVER 3,000 purchasing agents are expected to attend the 45th annual convention of the International National Association of Purchasing Agents in Los Angeles, May 22-25, 1960.

According to Charles Perkins, Manager of Purchases, Union Oil Co., and president of the Los Angeles Association, the Los Angeles Biltmore Hotel has been selected as convention headquarters. Assisting Perkins are general convention chairman E. Benton Long, Purchasing Agent, U. S. Lime Products Division, The Flintkote Co., and general program chairman Victor Quam, Chief Deputy Purchasing Agent, Los Angeles County.

Quam has announced a new innovation at the 45th convention, "After Breakfast" workshop sessions lasting from 8:00 A.M. to 9:00 A.M. and held in the 10 Biltmore Hotel conference rooms.

Fork Truck Rodeo

NORTHERN CALIFORNIA fork truck dealers and American Material Handling Society members are now supplying registration forms to users for the Rodeo to be held Saturday, February 6, at the Oakland Naval Supply Center.

No limit has been placed on the number of entries each firm may make. Four heats and a run-off are planned and two courses are being planned to facilitate fast and continuous action. Interested firms who desire further information may write to Ellis H. Wooley, Fork Truck Rodeo Chairman, Code 44A, Naval Supply Center, Oakland, California.

Material Handling and Packaging Conference

THE STEERING COMMITTEE for the 5th Annual Industrial Material Handling and Packaging Conference announces that the 1960 affair will be held at The University of California campus in Berkeley, California. Fact-packed technical sessions of the one-day conference will get underway with registration at 8:15 A. M. in Dwinelle Hall Tuesday, April 12, 1960.



STEERING COMMITTEE makes plans for 5th Annual Industrial Material Handling & Packaging Conference. Seated left to right are: James C. Goble, Robert Sherry, Neil Chaittin, Stanley J. Bober, M. O. Richter, William Dalton.

Stanley J. Bober, Industrial Equipment Consultant, has been named Chairman of the 1960 Conference Steering Committee. Bober, in announcing the date and location of the conference, stated, "The 1959 attendance stimulated at the conference held at Stanford University last March—some 286 interested material handling and packaging men from all phases of industry—will probably be surpassed this year. The conference has gained in quality and attendance every year. Our committee is endeavoring to maintain this increase."

Registration fee for the Conference has been set at \$15.00 with a reduced rate of \$13.50 for registrations in the mail no later than February 1, 1960. The registration fee includes the cost of luncheon on the University of California Campus and entry to all conference events. All persons interested in registering for this important technical affair may contact M. O. Richter, Kaiser Aluminum & Chemical Corp., 1924 Broadway, Oakland, Calif.

MEET MRS. PETER PEFF

... and her company's new lightweight liquid-oxygen "vacuum bottle" for jet planes



Mrs. Peff, president, Superior Air Products, Newark, N. J., with Supairco's recently developed liquid-oxygen "vacuum bottle."

Many a tough problem has been solved by Mrs. Peff and her company since 1952, when she assumed the presidency after her husband's death. Specialists in building low-temperature apparatus and complete plants to produce oxygen and other gases, "Supairco" was asked recently to develop a light, compact container to supply oxygen for aircraft crews at high altitudes.

Ingenious design utilizing the broad and varied properties available in copper and its alloys produced the "vacuum bottle" shown above. The inner sphere is of Everdur*, Anaconda copper-silicon alloy, which has the workability and resistance to corrosion needed—and, more important, the strength and toughness to make possible a relatively thin, light shell that can withstand vibration and fatigue stresses aloft—plus shocks from catapult launchings and carrier landings. The outer shell is of Anaconda copper, highly polished to reflect heat. This, plus a vacuum under .001 microns between the spheres, holds liquid oxygen at —297 F.

Starting with over 100 standard copper alloys, Anaconda can provide an almost unlimited number of combinations of useful properties. When unusual problems arise, use Anaconda technical specialists to help you select metals for your needs. Address The American Brass Co., 14900 Garfield Ave., Paramount, Calif. In Canada: Anaconda American Brass Ltd., New Toronto, Ont. 6041FC





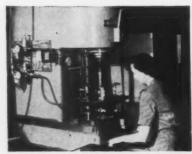
LEFT: Inside the copper shell in main illustration is this slightly smaller liquid-oxygen container made of Everdur, the metal that spins and machines readily, is easy to join by soldering, brazing, welding. RIGHT: Completed liquid-oxygen converter, built by Mine Safety Appliances Company, Pittsburgh, Pa., serves 8-man crew. It is one-third the weight of the cylinder it replaces, takes much less space.

ANACONDA

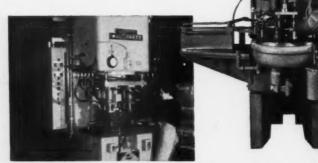
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Made by The American Brass Company

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Which of these MULTIPRESS ideas will save you money...NOW?



Toy maker forms 1000 parts per hour n Multipress forms metal toys faster, at less cost for Mattel, Inc.



Motorola speeds production...with 100-ton Multipress that precision-punches up to 450 holes at a time in plastic TV chassis bases.

Dermeyer triples production of food mixer parts . . cuts scrap loss, too, with 8-ton Denison Multipress-12-station index table.



Waterman boosts output 800% with 1-ton Multipress that "angles" precision C/C pen parts



Cuts cost 73% on sub-assembly of specialty products at George S Thompson Corp with 4-ton Multipress . Savings - 11¢ per unit.



Prints Electronic circuits 3 times as fast at Barry Process Co. with 4-ton Multipress. Controlled timing and pressure assure uniform carbon ink deposit on each printed resistor.



Auto-lite automates assembly of over 150 different types of spark plugs with a battery of 3 Multipresses operating around a 48-station index table.



Production up 33% at Cleveland Graphite Bronze
- where 25-ton Multipress compresses soft carbon
cores at the rate of 100 per hour.



Trimming rubber flash twice as fast...4-ton Multipress with 6-station index table trims flash from 2400 molded rubber parts per hour. Old method

Time and money savings like these are only a few of hundreds that Denison Multipress can help you make in keeping ahead of competition today.

But modern competition means more than simply faster production. That's why Multipress plus-benefits are so important.

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Installation of Colt SR Ventilators, Dray Manufacturing Company, Downey, California.

New COLT O/SR NATURAL **GRAVITY VENTILATOR**

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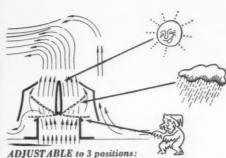
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> LIGHTWEIGHT, of anti-corrosive aluminum alloy, no strain on roof.



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COMPANY _



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Acme Idea Man
J. R. Roberts
suggested the
benefits of the
F-3 Machine to
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California.



National Container Corporation of California, Oakland, uses an Acme Steel F-3 Strapping Machine to gain important benefits through unitizing corrugated boxes. (Idea No. S3-32)

Some of these benefits are better product flow through the shipping department, a 50% reduction in handling time, increased truck payload, greater use of storage areas, and dollars saved by reduction of packaging materials costs.

The F-3 successively compresses the package and tensions, cuts and seals one strap—or two or three straps simultaneously—while the package is under compression. Air powered and electrically controlled with push-buttons, the F-3 applies each strap with uniform, pre-determined tension. Packages of varying sizes can be compressed and strapped in any sequence without machine adjustment.

*Know your Acme Idea Man. He can give you the full details on how you can make best use of the F-3 Strapping Machine or the Acme Steel products that fit your particular needs. Call him today at the nearest Acme Steel office. Or write: Dept. WCS-129, Acme Steel Products Division, Acme Steel Company, 4901 Pacific Blvd., Los Angeles 58, California. Also San Francisco, Seattle, Portland.

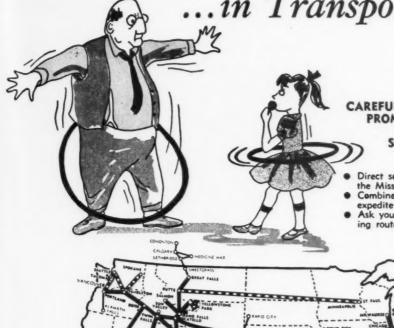


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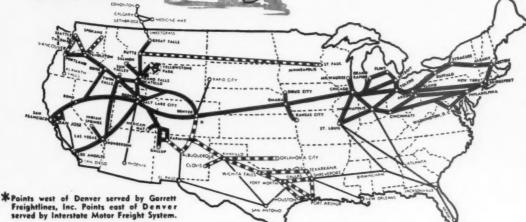
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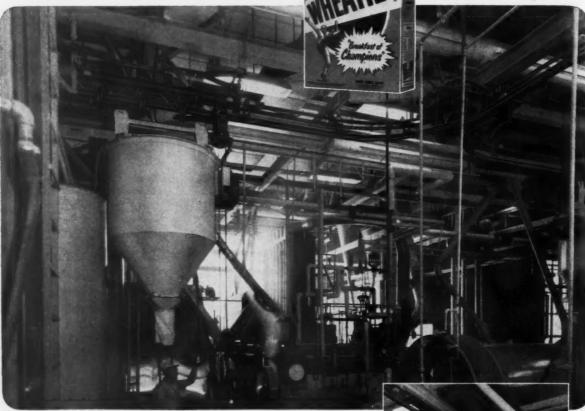
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Handles Wheat for 108,000

PRODUCTION

Boxes Daily



Buckets are filled with cracked wheat the wheat and shuts it off automati-here. A Tramrail track scale weighs cally when a bucket has full weight.

THE appetite for Wheaties is countrywide and requires many food plants to satisfy. To take care of a large part of the west coast demand, General Mills has a large, clean, modern plant at Lodi, California.

A Cleveland Tramrail bucket system consisting of a bucket on a motor-driven floor-controlled carrier handles wheat for the Wheaties to four cookers. The wheat is piped directly to the buckets by a duct from the floor above. It is weighed automatically by a track scale in the Tramrail system. When the exact amount is in a bucket, a valve shuts off the flow to the bucket.

This installation illustrates one of the hundreds of ways Cleveland Tramrail is being used to make materials handling easier, faster, safer, and less costly.



Emptying into one of the four cookers.

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Whether you specify or apply power transmission equipment, your nearby Wagner Sales Engineer will be glad to help you select the right drive for your applications.

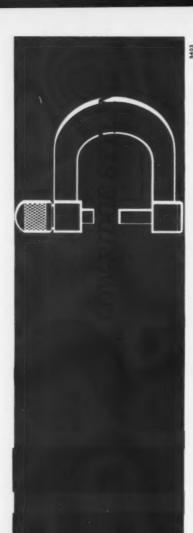


Improved lip type seals are used on horizontal shafts. On vertical output shafts, double mechanical seal with slinger and drain-off gives positive protection against leakage.

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THE LOOK IS L O W IN BUSINESS BUILDINGS

New Soulé series 112 buildings feature the modern, up-to-date "low-ridge" style. Their good looks help you meet building code restrictions without staggering maintenance. Versatility is another virtue of these buildings. You can use any material custom costs. Yet, you still get wide, clear, post-free work area, ruggedness and low core and high fashion style are standard with Soulé series 112 units. for walls and trim that suit your needs and budget. The basic building

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48 / METALS



PLANT POWER increased in inexpensive way

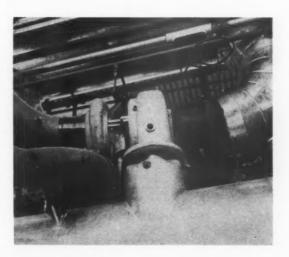
Firm adds 9,000 hp. to stationary gas engines by use of turbochargers, saves costly power plant addition.

NCREASING the power capacity of a permanent installation can be extremely expensive, particularly so since such an increase usually requires either replacement of existing units for larger ones or installation of additional power units with an added increase of plant buildings in which to house the additional units.

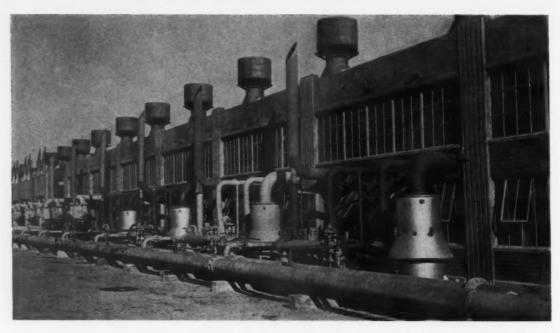
The Richfield Oil Corp., being faced with this problem of boosting horsepower produced by a bank of stationary engines, has successfully solved it at a relatively inexpensive cost. The firm has increased substantially the capacity of its gas compression facilities in the Bakersfield and Cuyama Valley, Calif., areas and done it without using larger engines or increasing the number of engines and adding costly plant buildings.

The solution was found in the addition of multiple AiResearch turbochargers, more than 120 of them, to the bank of 30-odd Clark natural gas-powered engine compressor units used in the installation. As a result the total power output of the installation was increased 9,000 horsepower.

The project was carried out as the result of a program planned in conjunction with the Garrett Corp., AiResearch Industrial Division, Los Angeles. Project engineers found that a healthy 25% to 35% increase in normal power ratings of a variety of Clark engines



CLOSEUP OF AIRESEARCH turbocharger installation on gas engine. T-shaped exhaust manifold directs exhaust gases into right side of turbocharger, center. Ambient air reaches the turbocharger compressor wheel through upper ducting with taped connection, left, and is sped to engine intake manifold via lower ducting.



EXTERIOR SHOT of Richfield building in Bakersfield that houses the turbocharged units. Filtered intakes atop the building feed air to engine manifolding, exhaust stacks direct fumes away from the building. Note complex piping and metering system for natural gases.

could be realized by turbocharging. Moreover the power increase was an efficient and economical one.

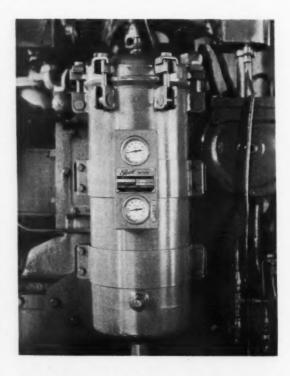
There are seven different Clark models in the bank of engines pumping natural gas from Richfield wells. The pumping is on a round-the-clock basis. Clark models include RA-6s, MRA-6s, HRA-6s, HSRA-6s, all of which are six-cylinder power plants. Four turbo-chargers have been installed on each of these engine models. The model MA-8s is an eight cylinder engine model. On these, dual turbochargers have been mounted. The RA-32s engines are three cylinder types, and these also use dual turbochargers.

All installations use AiResearch model T3011 turbocharger units, except one two-cylinder engine.

Basically turbochargers, which are powered by the energy of the engine exhaust gas, move quantities of high density air into the engine intake manifold.

This ram effect accommodates additional fuel that provides increased power output but at reduced specific fuel consumption. Linking the turbocharger and intake manifold is an intercooler used to increase air density and for lowering processed air temperature. Air from the turbochargers passes through the intercooler en route to the intake manifold. Not only has air density been raised but this process reduces the air temperature to slightly over 100 degrees F.

All engines are fitted with a pre-lube pump that services aluminum bearings during startup or for maintenance during engine shutdown. Five-micron oil filters were installed to insure clean lubrication and to boost service life of moving parts.



PREVENTION OF BEARING WEAR is function of this Peco, five-micron oil filter installed for the turbocharger lube system. This is separate from a larger five-micron filter for the engine.

PORTABLE TANKS

for shipping liquids

Chemical company uses 300-gal. portable aluminum tanks to ship liquid adhesives and resins.

OOKING TO THE FUTURE with the idea of capturing more of the large Northwest market, Borden Chemical Company, manufacturers of adhesives and resins, early in 1956, initiated a test of using a 300-gal. portable liquid container for the intra and interplant handling of various liquid products shipped from their various plants at Springfield, Oregon; Kent, Washington; and Los Angeles, California. A test program of handling urea formaldehyde shipped to the wood industry, now centered near Springfield, Oregon, was put in motion at the Oregon plant.

Borden rented a Tote Tank, the 300-gallon container now in extensive use at their West and Northwest facilities, for a six month period to ascertain the feasibility of such handling of liquid adhesives and resins. Tests were first conducted at the Springfield plant and then at the lumber industry customer plant. The test proved to be very successful.

As a result of these tests Borden made several design suggestions regarding the use of the new container for resins and adhesives to Tote System, Inc. These included changing the valve to elbow valved with separate shutoff and using special fittings to avoid color contamination of waterwhite urea. A special angle was welded near the valve to protect it from fork truck damage. The top closure size was enlarged to that of standard drums for easy cleaning. A top vent plug was added to allow full flow out without removing top.

These changes were made and Borden began its program of liquid handling in Tote Tanks. One of the problems involved was possible customer resistance to the change and Borden at the start attempted to show their customers the benefits. These included single handling of one tank, holding the equivalent of almost six 55-gal. drums, by fork truck from dock to point of use. There is also a space savings in plants

where space is at a premium and less chance of contamination. In production operations only one mechanical movement is required in place of moving six drums by hand. There is a safety factor too in eliminating lifting problems, and several pounds less waste caused by adhesive hangup in six containers as against one. By stressing these and other factors, minor customer resistance was overcome early.

In plants where there is no fork lift Borden representatives have shown personnel how inexpensive carts could be assembled from junked parts so that the Bins could be easily wheeled around.

When empty the Bins are returned to the delivering carrier, collect, to the Borden Company, Chemical Division, at the original point of shipment.

As a result of this program, acceptance now has been so complete that, at present, Bins can only be supplied to customers using one Bin a month, a high quantity since products normally are used in small batches.

OPERATOR FILLS Tote Bin with liquid adhesive at Borden Chemical Company plant. Bin made of aluminum will hold 300-gals. or almost as much liquid as six 55-gal. drums and can be handled and stacked easily by use of fork truck. Acceptance by customers has caused steady increase in Bin use.



PRESSURIZED CONTAINER wins prize

Considered best USAF-Industry developed container

NEW ALUMINUM container that is pressurized, stackable and shockmounted has been developed through combined efforts of two Southern California firms and the Air Force. It weighs approximately 130% less than its wooden counterpart, has high reuseability and offers excellent environmental protection for shipping vernier rocket engines made by Rocketdyne division, North American Aviation.

Built by Harvey Aluminum, Torrance, Calif., the package won first place for the best USAF-industry developed container at the recent Air Material Command Packaging and Materials Handling Conference held in Oklahoma City.

Jointly designed by Henry Roe, San Bernardino, Calif., Air Material Area, USAF; Milton Peterman, Rocketdyne, and Harvey Aluminum engineers, the container is built with integrally stiffened aluminum extruded skin panels welded to cleats suitable for fork lift use.

The top of the container is securely fastened with 10 fittings. The award-winning unit replaces five heavier metal packages of various sizes and shapes. Modular design of the box permits many size variations.

Currently on the drawing boards at Harvey Aluminum is another container for monocoque design that is built up from heavy press cylindrical extrusions for the skin panels and thin-web press forgings for bulkhead supports. This technique will enable the company

to fabricate aluminum containers up to 100-ft. or more with diameters large enough to accommodate giant missileframes.

SHOCK MOUNTED, pressurized aluminum container shown with vernier engine ready to ship. Left to right are M. J. Peterman, Ron Nelson, K. D. Miller of Rocketdyne.



SURVIVAL CONFERENCE for industry

West Coast industry must have survival plan ready in case of disaster

RESPONSIBILITIES of West Coast industry in defense against disaster were outlined recently for hundreds of conferees attending the Second Western Industrial Survival Conference held under Chamber of Commerce sponsorship in Los Angeles.

According to conference keynoter Leo A. Hoegh, director, Office of Civil and Defense Mobilization, so long as the weapons and delivery system exists, industry must consider itself to be in great danger of a calamity beyond anything this earth has yet seen.

Hoegh pointed out that in addition to having a willingness for survival, industry must have the capability of quick restoration of production.

To further this goal, a number of points of action

were described to the conference. Among these were: Planning and organizing industrial "self help", providing employee shelters, planning plant evacuation, protection of vital business records, restoration and repair procedures, and blueprints for dispersal to new industrial sites.

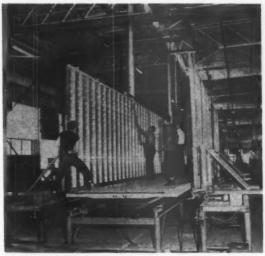
Workshop sessions held during the event covered industrial mutual aid, records protection, industrial medical and safety programs, protective construction, emergency transportation and supply.

Nearly a score of exhibits prepared by disaster agencies, company operated organizations, and commercial groups were displayed during the Ambassador Hotel conference.

MODERN PRODUCTION

needs modern facilities

New trailer plant is efficient through combination of latest production techniques and good material handling methods.



SIDE PANEL is mated to chassis of aluminum van.

Panel is held in place with OH crane

until joints are complete.

The largest West Coast plant for production of truck trailers has just been opened by Fruehauf Trailer Co. in Vina Vista, Ontario, Calif. and is incorporating new trailer fabrication techniques along with efficient materials handling on four semi-automated production lines.

The 150,000-sq. ft. facility covers 100 acres and is designed for straight-through production flow. Raw materials and finished components such as tires, hubs, brake assemblies, are received at the west end of the plant and completed trailers are discharged from final

inspection at the east gate.

A bus-duct system is installed along each assembly line to permit electrically-powered equipment to operate without use of long and cumbersome extension cords or cables.

A material handling feature is use of Vaculift OH cranes to move flat-surfaced items such as sheet aluminum. Other installations, including those by American Crane & Hoist Corp. and Yale, service both the production line and its support facilities like the machine shop, foundry, and mill room where wood panels and flooring are prepared.

At Ontario, a 200-man work force (500 by 1961) is turning out the first Fruehauf interchangeable vans on the West Coast. This new, all-metal unit offers weight saving options between steel and aluminum construction.

Aluminum and steel parts are fully interchangeable including cross members, structural posts, roof bows, door facings, and side panels.

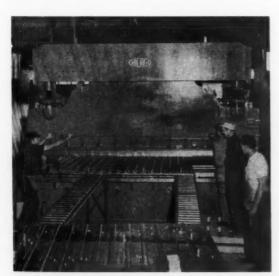
Of the four assembly lines, two are for vans, one for flatbed trailers, and one for low boys, machinery trailers, and dollies.

Each assembly line is designed to begin at the raw material delivery area equipped with P&H overhead craneways. Here metal saws cut raw stock to workable length prior to plant entry.

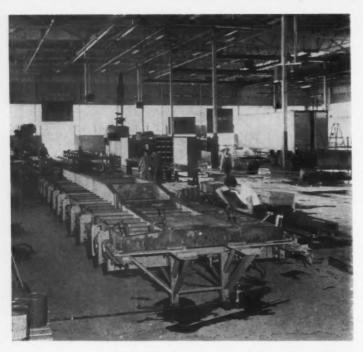
For aluminum vans, pre-cut stock is moved to a press brake where beading is applied. Rivet holes are then punched into the sheet that is now ready to become side panels. Each panel is uniform in size and shape for ease of future replacement and repair by customer maintenance shops.

Next production step takes panels to a rivet die punch press. Here rivets are inserted in access holes and upset to join a series of panels into a single unit trailer sidewall.

Meanwhile aluminum flooring is attached to the



UNIFORM WIDTH side panels are being joined with rivets in a rivet-die punch press. Note roller conveyor for ease of handling.



CHASSIS FOR flatbed trailer is shown being secured to welding jig where cross members are attached to main rails with Airco equipment.

trailer chassis. When chassis and sidewall are mated, the unit sits at the first station of the assembly line. The chassis suspension is then hooked to a Link Belt floor conveyor with a special bracket which pulls the trailer from station to station much like a car in an automatic wash rack.

Trailers are riveted throughout and cross members are placed on 12-in, centers for better support. Depending on customer option, front corner posts are installed either as extruded aluminum shapes or steel rolled sections. Flooring is made from hard surfaced aluminum alloy.

Using bonding techniques similar to those in the airframe industry, the roof of the aluminum van is made from a single 96-in. wide strip of aluminum that is uncoiled to the proper length, sheared and heat-bonded to cross members with a resin compound. Resin is prepared in a Semco Research Inc. mixer and applied under pressure.

The roof panel is then lifted into position and mechanically stitched with rivets in such a manner as to avoid rivet holes over the interior of the van, placing them only on outside edges of the roof.

For easy access to roof work stations, workers stand on permanent scaffolding erected on both sides of the production line. To reach across the line or to work in front of the trailer, workers use removable platforms fitted with casters that allow them to move forward with the production line.

Wheel and tire mounting, installation of rear doors, special fittings, lights, hardware, application of paint and final cleanup operations are stations that bring the van to the final inspection area.

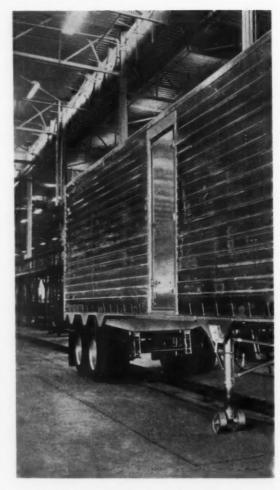
Another primary production line produces the Thoroughbred, a longitudinal board platform trailer (LBPM) that also features interchangeability of steel and aluminum components.

The LBPM configuration starts with structural steel longitudinal rails that are welded in a continuous fixture. Next, cross members are welded to the rails. The trailer is fabricated upside down to facilitate placement of suspension, undercarriage and wheel assemblies.

The full width cross members of the trailer are aligned through slots in the main rails and side, front, and rear rails are attached to box the framework. After fixturing is complete the entire unit is welded with Airco equipment.

After final body welding, the trailer is placed in a turnover unit that flips the flatbed back on its wheels.

Flooring is installed as the last major assembly step on the LBPM trailer.



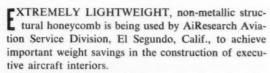
TRAILER STRADDLES Link Belt floor conveyor.

Bracket from chain to undercarriage of trailer
pulls the unit from station to station.

NON-METALLIC HONEYCOMB

lowers airframe weight

Lightweight non-metallic honeycomb is bonded under heat and pressure to provide durable airplane interiors



Honeycomb design, with its excellent strength characteristics, is being used almost exclusively in table and cabinet tops and bulkheads that are thicker than ½-in.

This form of construction was formerly used only where absolutely necessary, but its general use by AA-SC is now practical because of a recently acquired electrical pneumatic press built by Thermo Pneu Corp., Glendale, Calif.

The process of producing a honeycomb table top, as an example, is relatively simple.

The honeycomb material, made from tough, heavy



A LAYER OF FORMICA with wood skin laminated to underside is placed on top of honeycomb frame. Next step is placement between platens in press.

gage paper, is contained within a wooden frame and over this is fitted a layer of Formica that has a wooden skin laminated to its underside at 40 psi.

The assembly is placed between two ¼-in. aluminum platens and moved into the press. The electrically heated press operates at 185° F. and pneumatic pressure exerts 20 psi. on the platens. Heat activates a bonding agent which flows and mates the components into a sturdy structural member.

In other applications, wood panel covering is used instead of Formica. To accomplish lamination the press temperature is boosted to 235° F. and the sandwich is processed for approximately 8 minutes, about half the time required for Formica.

The form of construction with non-metallic substances offers striking examples of weight saving. Balsa cord sandwich material, once commonly used, weighs 22 oz. per sq. ft. A piece of honeycomb currently used that is equal in size and strength, nudges the scale a mere 5 oz.

TABLE TOP FORMED FROM HONEYCOMB structure is inspected after leaving Thermo Pneu press by Jim Bishop, right, wood shop foreman. Man at left is inserting new honeycomb assembly into press.



CLEAN ROOM

for quality production

Western firm separates production of rigid quality control gas regulators by using clean room for their manufacture.

WESTERN MANUFACTURERS, especially those who make parts for missiles or missile support equipment, are often faced with the situation where one of their items requires extremely rigid quality control in its manufacture. When this problem arose in the plant of Victor Equipment Co., engineering came up with an interesting solution. They designed and had constructed a special clean room inside the plant. They then moved all production (from parts cleaning and assembly through packaging) of the particular item into the clean room. In this way the extremely high standards of quality control required have been maintained. At the same time work flow on other manufactured items has not been impaired.

Victor Equipment Co. manufactures welding and cutting equipment of all kinds. One item, high pressure gas regulators, is used by the government in the ground support of missiles. The regulators are a limited lot item and are made in a number of sizes and types, to proprietary Victor designs.

One of the most important quality control factors in the manufacture of these regulators is that they be produced free of grease, dirt, lint, dust or other foreign matter in accordance with specifications. In addition the finished product must meet certain specific pressure and leak tests and be packaged to specifications. The clean room has been constructed to meet all these requirements.

This clean room is a complete unit in itself. Constructed by Moor & Hanks Co., El Monte, Calif., the room has its own walls, floor and roof and is located inside a large room in the plant. Extremely well insulated, the room is provided with its own humidity and pressure control unit, and all air in the room is filtered. Room temperature is maintained at 70-72 degrees F., humidity at 40-50%, filtration effective-

ness 90% of all 5 micron particles in all areas. There is a 20% fresh air change every 20 minutes, and a positive air pressure is maintained inside the room to exclude the entrance of contaminants.

All personnel in the room are required to wear nylon gloves, smocks, caps, and special shoes to eliminate lint. The personnel enter the clean room through an entrance having two small rooms. In the first room the special garments and shoes are stored. After putting them on, personnel step into a second room and must stand on a gelatin mat and receive an air shower where dust and dirt particles are blown away. Personnel may enter the clean room only after the time delay relay releases the door lock.

Parts are brought into or leave the room through one of two airlocks. The parts used in the various gas regulators are produced in the main plant where they are checked, degreased and deburred. However before they pass into the clean room, they again undergo special inspection and additional deburring if needed. From this point until the finished product is packaged, all operations are performed inside the clean room.

All parts, even though already washed during production, receive two additional cleanings. They are first immersed in a Narda ultrasonic washer where a filtered cleaning solution of Oakite 61A removes foreign matter by means of sound waves traveling through and producing an agitating action on all surfaces, threads and drilled passages. To remove all of this solution, parts are dried with clean dry nitrogen at 140 degrees F.

The parts are then immersed in a Baron vapor degreaser containing trichlorethylene. Because of closed nature of the room there was some concern about fumes from the trichlorethylene from the vapor degreaser. A thorough test was made by an outside testing company and it was found that the trichlorethylene did not exceed 30 parts per million, well under the 200 parts per million allowable limit.

After degreasing the parts are again dried with hot nitrogen. To ensure absolute cleanliness lots are checked under black light and with a filter paper wipe test. The use of a filter paper wipe test has also been found effective in checking tools and other items suspected of possible contamination.

To avoid contamination tool benches are covered with stainless steel, tote pans have been cadmium plated, and all assembly vises and hand tools are chrome plated. Regulators are assembled with personnel using nylon gloves, or, for hard to assemble parts, tweezers.

Line testing of completed assemblies is done on a test line which can provide a range of up to 10,000 psi. of clean dry nitrogen. Functional testing is followed by bubble leak tests with each unit submerged in filtered water. Hot nitrogen is again used to dry the parts.

All completed regulators are packaged in the clean room. Regulator parts and connection openings are sealed with metal or plastic caps. The entire unit is tagged and placed in a plastic bag and a vacuum hose used to draw all air from the bag. The bag is then sealed.



INTERESTING VIEW of clean room. Two airlocks for parts entry are on left wall while door for personnel is at far wall. Note vapor degreaser near door. Ultrasonic washer is located in well of bench next to degreaser.



LOOKING AT clean room from entrance. Man in foreground is drying parts with hot dry nitrogen. Men at right are testing regulators while others in photo assemble. Note white nylon caps, gloves and smocks.

MACHINING CHANGES cut operation costs

Restudy of turning operation saves \$4.15 per piece

WHEN A MACHINING operation involving the facing of cast iron housings at the American Coleman Co., Littleton, Colo., a manufacturer of axles and specialized vehicles, was restudied, it resulted in an overall savings of \$4.15 per piece, plus an increase in production of from five to nine pieces per shift. The improvement was a result of several changes, each of which contributed its part.

Company engineers found that the surface feet per minute could be increased from 289 to 510. They also designed a new method of holding the workpiece on the Bullard lathe used, which reduced the setup time, prevented buckling and did away with reworking of parts because of non-parallel surfaces. As a result production per shift was almost doubled.

Tools used are Kendex holders and Kennametal Grade K6 inserts. No coolant is used to make the interrupted 0.125 rough cuts or .050 finish cuts in the castings which contain many sand holes.

At previous cutting speeds the inserts lasted 48 minutes before indexing. The same inserts are now indexed every 15½ minutes. Despite this high loss in machining time life, performance life is reduced only 43%. This resulted in an increase in cutting tool expense of from 7.5 cents per hour to 27 cents per hour. This slight additional expense is unimportant when weighed against the greatly increased efficiency in using machine time worth \$6.00 per hour.

As a result of restudying the operation thoroughly



MACHINING CHANGES have improved this turning operation and almost doubled production plus bringing a savings of \$35.00 per shift.

the cost per piece of the facing operations has been reduced from \$9.72 to \$5.57 per piece or a per piece savings of \$4.15.

BUILDING CONSTRUCTION solves handling problem

Laminated wood beams allow wide column spacing, making handling easier

EFFICIENCY of operations in a building is in many cases dependent upon the foresight and preplanning, which has gone into that building's design. This is especially true of the new Montgomery Ward mail order distribution center in San Leandro, which covers some 13½ acres of floor space.

The chief function of this installation is to receive and store merchandise and to fill orders and ship to customers. As such the efficient handling of materials is a key consideration in the operation. To achieve handling and storage efficiency it was important that the building be constructed with as few columns as possible, within a reasonable cost.

The Austin Co., who designed and constructed the building, was able to solve this problem through the use of glue-laminated wood beams and girders produced by Summerbell Roof Structures Division, Fluor Products Co. These light weight roof members permit-

ted a column spacing of 40 ft., and provided a total of 1600 sq. ft. of clear space between 4 columns. This maximum column spacing has allowed Montgomery Ward to lay out their operation and handle merchandise with efficiency.

Not only was an all important operating problem solved but the building was constructed at a considerable savings, and at a cost of \$5.60 per sq. ft. This was possible because of the relatively light weight, high strength laminated wood beams, which could extend 600 ft. in length. These were set across glue-laminated girders, which in turn sit longitudinally on rows of steel columns. The 40-ft. span beams were also glue-laminated wood, and 1,000 of these were used. The roof was sheeted with ½-in. plywood sheeting. The use of light weight material in the roof has resulted in an economical construction of a building that is extremely efficient from a material handling standpoint.



FOR EVERY APPLICATION, THERE'S ONE CRANE OUTSTANDING...

IN PIPE MILLS: One of many P&H overhead cranes installed throughout the mill area, this P&H double-hook crane provides cat-quick but kitten-gentle handling of long and awkward loads of pipe. The twin-lift arrangement is typical of the complete attention P&H engineers give to custom-building cranes to your exact requirements. This means maximum crane efficiency with minimum operating costs because your crane is tailored for your job.

If you'd like more reasons why satisfied customers have made P&H the largest manufacturer of overhead cranes in the world, write for your free, information-packed copy of Bulletin C-42 to Dept. 111, Harnischfeger Corp., Milwaukee 46, Wisconsin,



HARNISCHFEGER

...quality and service for 75 years





Photo Courtesy Quality Aluminum Castings Company - Waukesha, Wis.

POURING "HOTS" TAKES P&H **PRECISION** HOISTING

Putting ladles of molten aluminum "on the spot" for careful pouring is a P&H Zip-Lift's full-time job in this foundry...a job it handles with a mother's care. From furnace to mold this husky hoist answers every command with a sureness that pinpoints the Zip-Lift's close-spotting ability.

P&H Zip-Lift is "safety-built" too - made to include the positive safety features needed to protect workers from harm. One-hand, fingertip control provides instant response without drift - even under capacity loads. Control current is stepped down to a low 24 volts to protect operator against electrical shock. A double-safe dual brake system stops loads immediately . . . and either brake holds the whole load even if power fails. Limit switches guard against hoist abuse . . . cut maintenance.

Pleasantly enough, Zip-Lift accuracy and safety are priced for the shrewd buyer — starting as low as \$200.

If precision safety and price are your buying yardsticks, you'll want a Harnischfeger Zip-Lift. It's fully explained in Bulletin H-20, yours for free from Dept. 203, Harnischfeger Corp., Milwaukee 46, Wisconsin.

PaH HARNISCHFEGER
...quality and service for 75 years

TRANSPORTATION and SHIPPING in the West

Vast distances . . . shortages of sources of supply . . . special types of manufacturing . . . create complex problems for carriers and shipping personnel . . .

TRANSPORTATION AND SHIPPING in the West creates problems seldom found in the East. For instance:

- Distances are greater in the West . . .
- Sources of supply are fewer and farther between . . .
- The type of manufacturing in the West especially food and Space Age production demands critical transportation schedules, special carriers, dunnage, fasteners, etc.

But delivery and production schedules are met, and fragile and perishable items are delivered undamaged. This is a tribute to the careful planning of both the transportation industry and Western plant executives.

WESTERN INDUSTRY editors talked with Western shipping personnel, gathering data on how special problems were solved. While some of these may sound unusual, the situations are becoming more commonplace. Maybe your problem is solved here.

Fast shipment of fragile, perishable items . . .

For fast shipment of fragile or perishable items, many Western firms use air freight.

Last year, machines and machine parts ranked first in air freight flown by a leading air line. Electrical equipment and parts ranked second and cut flowers were third. Other items, in order of total weight flown, include: printed matter, wearing apparel, auto parts and accessories, aircraft parts and accessories, hardware, advertising matter, and film.

As an example of how air freight can supply fast service for fragile goods, take the case of a Modesto turkey rancher. This rancher had 5,000 lb. of turkey eggs ready for shipment to Toledo, Ohio.

The rancher called United Air Lines office in Modesto for "Reserved Air Freight" booking—to get space guaranteed for his turkey eggs as a passenger would request a seat reservation.

United's Modesto office then teletyped the Payload Control Cargo Expediter in Denver. The Expediter consulted charts showing load distribution on every one of United's daily flights. From his charts, he worked out the best route for shipment, then teletyped Modesto and every station that was to handle the turkey eggs on their way to Toledo.

In Modesto, the United manager phoned the rancher and put his two-and-a-half ton cargo aboard the next flight to San Francisco. The Modesto turkey eggs, packed only in simple pasteboard containers, were transferred several times during their trip across the country to take advantage of the best connections and to get them to their Toledo destination as rapidly as

possible—in this case only 15 hours from the rancher's first phone call.

And not a single egg was broken.

Transporting huge, delicate missiles . . .

When missiles move under their own power it's a spectacular achievement. But when they've got to be transported by a carrier, real problems arise.

Missiles come big—in the case of the Atlas, 114 ft. long, 16 ft. wide and almost 16 ft. tall. And they're equipped with delicate instruments. This represents a "handle with care", oversize load for any log book.

But missiles like the Atlas are being transported on Western highways with almost as much ease as a crate of eggs. It took some doing; here's a case in point:

An Atlas had to be moved from Convair's Astronnautics Div. in San Diego to a test site at Edwards Air Force base in the Mojave Desert. The job was assigned to Pacific Intermountain Express.

Weeks in advance the projected route was presurveyed by Convair to allow adequate turning radius at each corner and to avoid as many highway underpasses as possible. Even so, the towering missiles had to be inched through two overpasses on Highway 66 south of Caion Summit.

A P.I.E. crew of 10 had to undergo a day's schooling on handling and security. As a protective measure, two drivers were required in the cab. Since the rear wheels on the trailer provided by the Air Force had to be steered independently, two more drivers were

stationed in the back as tiller men to guide it around turns. Along with military personnel, P.I.E. driver supervisory cars fore and aft accompanied the convoy. Drivers and the rest of the party communicated with each other over walkie-talkie sets.

Now, moving such loads is like carting crates of eggs—thanks to the advance planning and careful working out of details.

Special railway equipment for missiles . . .

Special railway equipment may be used for Minuteman intercontinental ballistic missiles.

Discussions are being held at Boeing Airplane Co., Seattle, sub-contractor for the Minuteman, on the use of mobile equipment for the new weapons. In addition to placing the ICBM's in underground launchers, the Air Force is considering placing the missiles on railroad trains and trucks traveling at random over the nation's transportation network.

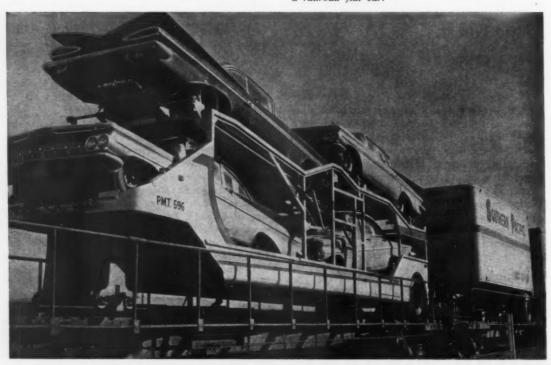
The units would present an almost impossible target and would enable the missiles to launch a retaliation.

Trucks, trains team up for huge hauling . . .

Hundreds of millions of pounds of cement have been delivered to a new Naval air base site near Fresno, Calif., by an efficient arrangement between trucks and trains.

Freight cars of the Southern Pacific Co. drop cement into a hopper located in the center of the track. Then the cement is scooped up by conveyor and deposited into a silo. From the silo, a truck

PIONEERED IN THE WEST by Southern Pacific was piggybacking of autos, traditionally shipped in box cars, four to a car. Four or more autos can be loaded on a truck trailer and two truck trailers on a railroad flat car.



from Pacific Motor Trucking can be loaded in nine minutes.

Unloading directly from the rail cars into the trucks by "bazooka"—a direct conveyor setup—puts the truck back on the road in from 17 to 20 minutes. By this method a car can be emptied in slightly less than an hour.

And by use of both methods, two trucks can load simultaneously and then whisk to the site.

Boosting payload of asphalt shipment . . .

How to boost payload of asphalt shipments over Northern California and Northwestern Nevada routes was the problem faced by Sheldon Oil Co., Suisun City, Calif.

Solution: use of new aluminum Fruehauf pull trailers.

Result: "Our drivers are delivering more than two extra tons of heavy asphalt each trip (average boost from 20 to 22.5 tons) since we put our first Fruehauf aluminum tanks on the road," says Ralph A. Darville, manager of transportation, Sheldon Oil.

For tricky hauling assignments, Sheldon operates a 35-ft. tandem axle Fruehalf semi where need for high maneuverability in small or restricted areas rules out use of other rigs.

Sheldon is typical of many transportation firms in the West in that it must cope with vast distances travelled through remote areas with limited service and maintenance facilities.

The company logs more than 2 million miles annually from the Merced County line, California, north to Oregon and east into Nevada.

Long distance shipping of delicate aircraft parts . . .

Cost headaches associated with long distance shipping of delicate aircraft parts between North American Aviation, Los Angeles Division, and the Air Force Sacramento, Calif. Air Material Depot have been solved to a great extent through use of Klimp fasteners . . . quick acting steel closures used for assembly of cleated-panel reusable shipping containers.

Parts are being shipped in 4-ft. by 2-ft. by 8-in. and 4-ft. by 4-ft. by 8-in. plywood containers at costs of \$3.28 and \$3.72 respectively. Klimp fasteners are the only devices used to hold them together, eliminating need for nails, screws, staples, glue.

Biggest cost saving is found in reusability of shipping containers. For example, Fortier Transportation Co., Los Angeles, has shipped, via truck, boxes that have been disassembled and loaded on the truck bed in knocked-down condition.

Reshipment of panels from Sacramento to Los Angeles, about 435 miles, costs approximately 6.4 cents per \$1.00 of container value and costs only \$1.63 for the largest box in use. Boxes have a 10-time reuse factor.

Klimp fasteners lock and unlock with a few deft taps of a hammer and their use does not require highly skilled labor. Navan Products Inc., Los Angeles, is the maker.



WORKER APPLIES AIR HOSE to fill Short Kwik dunnage to protect rail shipment of canned Del Monte crushed pineapple. Sunkist Growers, Ontario, Calif. also uses cushions to cut in-transit damage.

Preventing damage on long hauls . . .

Inflatable rubber "pillows" now enable canned fruits to take long cross-country freight train rides without being damaged, according to United States Rubber Co.

The pillows—actually large, inflatable cushions called Shor Kwik—are used in place of conventional wooden bracing. When the load shifts in transit, airfilled units automatically take up the space, keeping the shipment tight. Over the past year they have been widely used in rail shipmens of such commodities as paper, lumber, bricks and canned goods.

For example, the Orange Products Division of Sunkist Growers in Ontario, Calif., began using Shor Kwik dunnage a year ago for shipping orange juice concentrate with average net savings of \$14.00 for each car, each trip.

This is figured by taking gross savings of lumber dunnage, \$20.60 in labor and other materials, and subtracting the cost of returning the deflated Shor Kwiks at an average of \$6.

What is of major importance to the food shipper is that he can cut down his damage losses. In lumber dunnage shipments, considerable damage was reported in 62% of cars, with some damage noted in all cars, for an average damage cost of \$156 to Sunkist. Using the pneumatic dunnage, damage was cut to 14% of the cars and those had only minor damage amounting to \$15.55 per car.

Inflated dunnage cushions measure 4 ft. by 4 ft. or 4 ft. by 5 ft. and fold into compact 6 by 15 by 24-in. cubes for easy storage or return. Made of weatherproof nylon with a neoprene coating on each side, they are equipped with a butyl-compound bladder, similar to a tire inner tube.



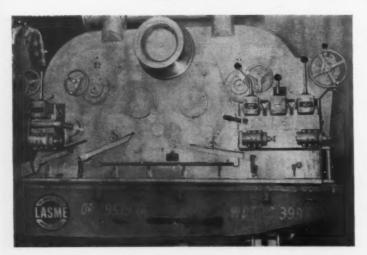
AIR FREIGHT provides fast delivery of vital, perishable, and fragile items. In this case, a jet engine is loaded for speedy delivery to its destination.

Designing, testing products with shipping in mind . . .

Product designers, for the most part, are concerned with environmental conditions produced entirely by and during operation of their product.

But a vital factor, often overlooked, is what happens to a product during the shipping process, during its transfer from railcar or truckbed to the shipping

TYPICAL OF TOUGH, long distance hauling performed by trucks is this 5-ton all-hydraulic winch—the biggest of its kind in the world—recently transported from Seattle to San Diego.



dock, or as it sits exposed to the weather on a pallet or skid awaiting transport.

As a service to shippers in the West, American Laboratories, div. American Electronics, Inc. is conducting environmental and reliability product testing in a facility at Fullerton, Calif.

The plant is dedicated to the fact, as their general manager William H. Grumet puts it, "that nearly all products have to be shipped."

Grumet points out that transportation of a product may expose it to more severe conditions, in many cases, than its design calls for. Take easy to damage items like electronic spare parts. Shipping may subject it to greater stress than its most extreme operating environment while functioning in a missile or aircraft.

Led by Noble Jones, president, the firm conducts drop tests in a sand drop shock tower. Products and packaging can be subjected to repeated decelerations to 120 g, from 5 to 30 milliseconds. Packaging engineers can now have their testing done to meet applicable civilian and military packaging specs or product specifications.

Air transportability testing, gaining in importance as air cargo shipments increase, can be accomplished on a horizontal shock tower which has a 160-ft. runway. The tower is capable of placing stress on a simulated shipment up to 10,000 lbs. to levels of 10 g for up to and exceeding 100 milliseconds.

Other stations can determine damage from railcar or truck humping operations. Weather damage is also studied in an environmental test chamber at the Fullerton facility.

Saving weight on shipping containers . . .

Weight savings has been an item of major importance to airfreight carriers and their customers alike. Heavy, bulk containers make the shipper's job tough . . . and the customer dislikes paying for non-cargo poundage.

When Boeing Airplane Co. decided to ship jet engines to its Seattle plant via Flying Tiger Line, shipping containers were analyzed.

Jet power plants had been shipped in costly metal containers that weighed almost as much as the 4000 lb. engine. Boeing's traffic manager, Leo Meyers, saw an opportunity to avoid use of the heavy, \$1750 shipping can.

Working with John L. Higgins, vice president of Flying Tiger, the two men came up with a lightweight metal shipping buck that could be built for \$1200 and would weigh only 1/8 as much as the can.

The buck is a skeleton structure with four arms rising upward. It appears much like a man, lying on his back, cradling a solid object above him with his hands and feet. A nylon sleeve fitted over the engine guards it against moisture and dust and completes the unit for shipment.

Savings were made in packing weight, material costs for the buck, and handling along with far faster delivery of the engines. Two other jet aircraft manufacturers have begun using the buck and airlines ordering jet equipment are switching to use of this package for engine transportation.

TOWMOTOR RUCK Stacks either side in 6-foot aisles...

Increases storage capacity up to 35% . . . gives you an "extra warehouse" free

Newest idea in fork lift trucks!



...also performs like standard lift trucks

The "Naro-Aisle-Stack" series is a Towmotor "first" that offers an entirely new mass handling technique in fork lift truck operation.

Equipped with hydraulically operated outriggers, Towmotor "Naro-Aisle-Stack" trucks perform right and left angle stacking in aisles 6 feet wide, or from four to six feet narrower than lift trucks usually require.

In addition, they also perform all of the functions of a regular fork lift truck. They pick up and lift heavy loads at speeds of 70 feet per minute. Their built-in maneuverability and pivot-action make it possible to operate in congested storage areas and turn sharp corners with the agility, safety and comfort only a sit-down type truck offers.

The new Towmotor "Naro-Aisle-Stack" truck is made possible only by the use of the exclusive Towmotor Towmostatic Drive—the drive that eliminates the clutch, the transmission, the drive line, the differential and all shifting mechanism. It's a brand new idea in fast, efficient materials handling.

For complete information, write Towmotor Corporation, Cleveland 10, Ohio, and ask for folder No. F-37.

TOWMOTOR



LEADERS FOR 40 YEARS IN BUILDING FORK LIFT TRUCKS, CARRIERS AND TRACTORS

Gerlinger Carrier Co. is a subsidiary of Towmotor Corporation

. . . for more details, circle No. 20 on Reader Service Postcard

LIFT TRUCK

uses side loading

Space, handling time and damage are reduced by use of new side loading lift truck. Requires less aisle width than with conventional equipment.

MAKING ITS WEST COAST debut is a new system for storage and transport of sheet stock and metal parts with the Baker Traveloader industrial truck that is reducing space requirements, material damage, and handling time at Convair San Diego, Rose Canyon storage facility.

Here sheet, plate and other aircraft components are being stored in 26,240 sq. ft. of racks. According to B. J. Handwerker, Rose Canyon material handling engineer, metal items are now available one skid at a time, eliminating the former method of digging through

floor-stacked skids until the wanted item was found.

Side-loading Traveloaders ride up the aisles between racks and pick off the required skid from the shelf in a fraction of the former time. One man can perform the stock picking function rather than the three men used with the old method, two loading and unloading a sling, one man working an overhead crane.

The crane has been freed for other uses and previously inaccessible storage areas can be reached with the truck, Handwerker pointed out. In this category was some 4,000 sq. ft. between supporting colums that could not be serviced from overhead.

Previously, sheet and plate stock at Rose Canyon occupied 24,578 sq. ft., and an additional 7,900 sq. ft. of blocked area totalled 36,478 sq. ft., about a third again as much as needed by the new system.

Saved space was used for expansion of the raw material storage and enlargement of the receivinginspection department.

Since the Traveloader does not have to maneuver to perform in the aisles, racks can be placed closer together than with conventional fork trucks. The Traveloader mast has complete horizontal travel while the truck itself remains stationary. Distributor for Baker industrial trucks is Green-Penny Co., Los Angeles.

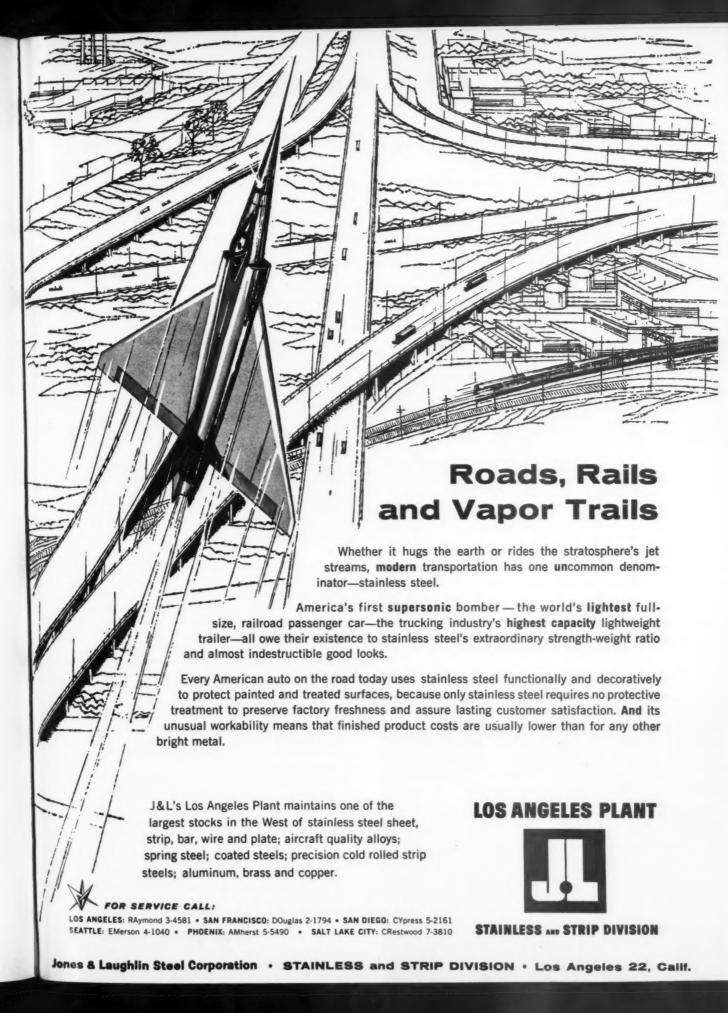
Each of the new rack sections has a capacity of 40,000 lb. Shelves are adjustable and can handle sheet stock or other materials up to 6,000 lb. On top is a mezzanine, connected with catwalks, where additional material can be stored.

A central stairway provides access to upper storage areas. Racks were installed by the Rack Engineering Co. of Calif., Gardena, Calif.

SIDE LOADING Baker Traveloader lift truck deftly picks skid of sheet from new storage rack. Note limited aisle space needed by truck.



42



AIRCRAFT SHOW has latest electrical developments

15,000 view 210 exhibits at Aircraft Electrical Society exhibition

THRONGING TO THE recent Aircraft Electrical Society Display in Los Angeles were more than 15,000 electronic engineers, technicians, and members of management who viewed 210 exhibits of electrical and electronic equipment for missile and space-age use.

During the exhibition, three evening panel sessions were heard in Pan Pacific auditorium covering travel in the space age, testing of electronic apparatus, and the status of semi-conductor solid circuitry.

In addition to live programs, the AES offered a twelve-film series on technical subjects ranging from the nature of corrosion anode and cathode processes to problems connected with launching of the recent lunar probes.

Exhibitors literally ranged from A to Z beginning with Aga Division, Elastic Stop Nut Corp. of America, and ending with the W. E. Zimmerman Co., Beverly

Hills, Calif., manufacturer of blowers, capacitors, gears and specialty switches.

Westinghouse Electric Corp. staged a comprehensive exhibit including welding equipment, closed circuit industrial television and power generation systems.

Actuators, alternators and electric heating systems were among the displays of the Pasadena, Calif., Division, Western Gear Corp., while Standard Wire & Cable Co. featured cables, cable assemblies and wire marking devices.

In the Barber Colman Co. booth were found motors, positioners, relays, temperature controls and valves. The Garrett Corp. exhibits included industrial air conditioning equipment, connectors, motors, and constant-speed drives.

Micro Switch Division, Honeywell, staged an exhibit of automation equipment, missile components and switches.

AUTOMATIC FURNACES increase production, improve parts

Drill bushings receive faster, more uniform heat treating

NCREASED PRODUCTIVITY and high batch-tobatch uniformity in heat treating of drill bushings has resulted in more profitable operations at the San Leandro, Calif., plant of Ace Drill Bushing after installation of Ipsen Automatic Heat Treating equipment.

In their new 26,000-sq. ft. facility, Ace has been

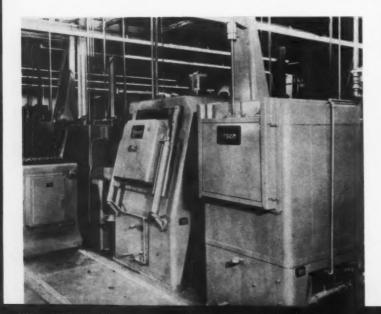
producing bushings made from type 52-100 and other specialty alloys with tolerances to + .0003-in. and a 62 to 64 register on the Rockwell C scale.

With the new Ipsen installation the firm has been able to more uniformly heat every part in the charge, despite weight. Controlled atmosphere in both the heating and quenching chambers has insured bright, scale-free bushings without necessity of a blasting or pickling operation.

Heat treating is accomplished in 100% forced convection and the radiant-heated atmosphere is circulated uniformly throughout the charge with a 30 mph. draft.

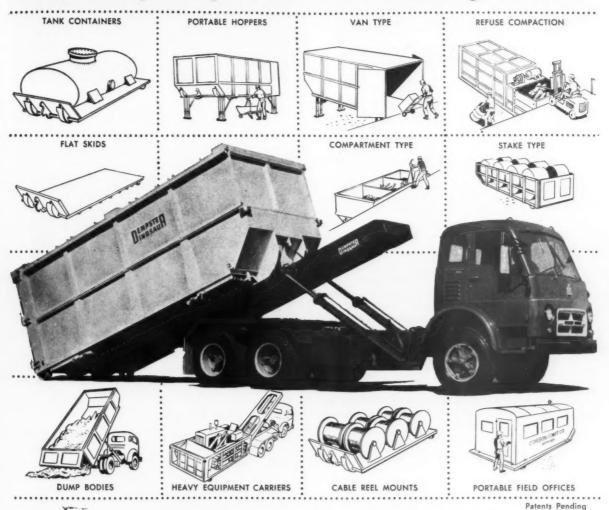
Dense loads of bushings are quenched with an oil flow of 4,000 gal. per min. The oil bath is under constant temperature control.

The furnace is electronically controlled with dewpoint and temperature closely regulated to any preselected setting on the control panel.



ONE OF TWO automatic heat treating installations in the Ace plant, the unit is direct loading and has a straight through design to ease work handling, up production.

One DINOSAUR With Detachable Containers Solves Many Complex Materials Handling Problems



Here's the materials handling tool that takes up where the fork-lift truck leaves off. Gigantic loads can be placed on skids, in tanks or containers. The DEMPSTER-DINOSAUR picks them up... automatically... in seconds... and whisks them to their destination, in-plant or to over-the-road locations. Here they are put down, intact... pushed off on a dock... left on telescopic legs... or dumped.

One truck handles any number of containers of many types. Value of truck is multiplied . . . standing-idle time is eliminated . . . loading and

handling is cut to the minimum. One man, the driver, handles the all-hydraulic operations without leaving the cab.

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FAST SPEEDS

cause design changes

Tiny racers can now go 80 mph. This speed requires redesign of a number of parts including a change to tapered roller bearings.

BUG ENGINEERING CO., Azusa, Calif., manufacturer of "Go-Karts", tiny, tubular-chassis racing cars, is using Timken tapered roller bearings for aluminum wheel assemblies that are being pushed to speeds up to 80 mph. in their "Scorpion" series Kart.

Although 80 mph. seems a tortoise-pace for the jet age, it is remarkable considering the Bug Kart has a mere 46-in. wheelbase, weighs about 86 lb., and is powered in the Scorpion series with three McCulloch 5.3-cu.-in. model MC 10 engines or a customer-specified power package.

Karting today is a far cry from the backyard puttputting that junior used to do with a lawnmower motor and a soap box derby chassis. Now thousands of enthusiasts are maneuvering well engineered-Karts in competition on a number of specially designed race courses.

Bug is one of the highest volume producers of Karts in the West and offers a full line of models with various powerplants including Clinton, West Bend, and McCulloch. In addition to Timken-equipped wheels, Bug makes dual internal hand brakes, or custom hydraulic systems, and automotive tie rod and drag link steering for their Karts.

This is how they are built. Starting with pre-formed specialty tubing of chrome, chrome moly, or mild steel, depending on capacity of the Kart, the frame is completely Heli-Arc jig-welded on Airco equipment.

To support the driver, a heavy gage sheet steel pan is welded over the three cross members on the frame. Axles, seat frame, motor mounts, and steering column are fabricated and attached to the chassis.

Then in automotive assembly line fashion, power plant, steering, and throttle linkage are attached and flooring and upholstery installed.

On the standard models, brake shoes are installed on the rear axles. Two Timken tapered roller bearings per wheel are fitted on %-in. OD axles. Both axles and spindles are machined and can be removed.



TUBULAR FRAMEWORK takes shape in jig. Parts are light but strong. Note framework for seat, motor mounting bracket, hollow rear axle.



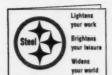
SEAT PAN is welded to bottom cross members and seat bracket. Company uses chrome, chrome moly and mild steel for parts.



DESIGN CHANGE made recently is use of tapered roller bearings. Change was made because car operates at relatively high speeds per size.

Ten or 12-in. wheels, depending on specifications, are placed on the Kart along with General "Jumbo-Junior" Knobby tires for dirt track use, or smooth tires for pavement.

Power transmission from engine to axle is via centrifugal clutch to sprocket and chain assembly. Gas tanks are spun aluminum and are bolted to the rear of the driver seat.



Westerners like these new ideas in ws steel



New Twist for Christmas Trees. There's Holiday magic in this "Karosel" revolving Yule tree base. Your lighted tree pirouettes in tune to cheery Christmas carols. It's all new and all steel, formed from USS Cold Rolled Sheets by Kresky Manufacturing Company, Petaluma, California. These, and 1,001 other toys and gifts of steel are strong, light and lasting, to give your family a Merrier Christmas.

Owner: George W. Marquardt; Architect: Glen R. Swenson; Contractor: Stewart Carlson.



New Designs for Dwellings. Exciting new shapes...rich, warm tones and textures plus lasting beauty are yours for modern living in a new home, styled in USS Steel. In a quiet meadow near Salt Lake City—a clean-cut case in point. The frame: slender, light-weight columns and beams of steel; ceiling: hollow-ribbed steel deck; exterior walls: panels of porcelain-enameled steel sheets for all-year weather resistance. Building soon? Ask your architect about the advantages of steel.

STEEL FOR EVERY PURPOSE FROM A SINGLE SOURCE

Much of the pleasure in being part of the growing West lies in serving its people of good will. To you in this Holiday season, all happiness and a prosperous New Year.

USS IS A REGISTERED TRADEMARK



New Pack for Party Pick-ups. Let guests come when they will—you're always prepared when your cupboard's filled with food in cans. Nibbles, snacks, dips and chips—or a bountiful banquet feast—canned foods, from consommé to cashews, are always easy to buy, store and enjoy. You'll open the door to quick 'n easy entertaining when you open handy foods in cans.



New Appeal for Appliances. Fathers know best—when it comes to pleasing Mom! Christmas-treat your lady with a work-lightening modern appliance in steel and give her more leisure time to enjoy with the family. Today's appliances designed in USS steels give lifetime service and satisfaction. (Aside to Dad: it's not too late to lighten her work with a major appliance that proudly wears the Steelmark tag.)



Columbia-Geneva Steel
Division of
United States Steel

TUBE BENDING

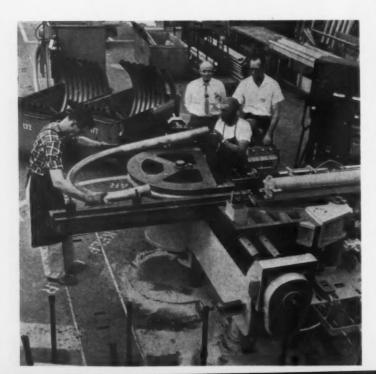
in one operation

Special stainless steel tubing and special machine make forming of complex shapes one simple operation.

A SIMPLIFIED AND EFFICIENT method of fabricating AM-350 stainless steel and tubing into complex shapes has been developed by Lockheed Aircraft Corp., Burbank, Calif.

More than 100 ft. of the Allegheny Ludlum stainless tubing is used by Lockheed for ducting in the Electra transport anti-icing system. Formerly elbows and joints to connect complex hot air tubing were made separately by drop hammering halved tubing to desired degrees of turn, welding the halves together, and then welding the pre-fabricated joint to the tubing.

To avoid this costly and many-sided operation on the new turbo-prop Electra, Lockheed engineers are bending tube into shape in one operation using highly





OPERATOR LIFTS tubing from machine with ease.

Tubing is highly formable thin and easy to handle stainless steel.

formable AM 350 tube and a company-designed forming machine with a curved mandrel and forming block.

According to A. H. Petersen, Lockheed Productivity Methods Section, use of AM-350 eliminates need for separate elbows and joints, and flanges to bolster tubing can be made integral with tubing.

Vital strength-to-weight characteristics of tubing are good at high temperatures and allow transmission of hot bleed air from four Allison 501-D13 jet engines to wing and tail surfaces to inhibit in-flight ice formation.

Ducting must be able to withstand 700°F. and pressures up to 200 psi. Gages being used range from .025 in. to .187 in. with OD's running from 1½ in. to 4½ in.

Tubing is supplied to the plant in a dead-soft annealed condition. After the metal has been formed it is processed annealed and then treated at sub-zero temperatures to provide maximum strength and hardness.

TUBING in dead soft annealed condition is removed from forming machine. Note curved mandrel and forming block in this company designed machine.

WESTERN INDUSTRY/DECEMBER 1959

Adv. opp. pg., circle No. 23 on Reader Service Postcard

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SPECIAL MANUALS

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BEARINGS

Bronze & Self Lubricating Bearings

This 36-page catalog gives full details on both bronze and self- lubricating bearings. Many charts help simplify the selection on sizes, types and tolerances. The catalog covers both standard and special brand bearings as well as all types of self-lubricating bearings including plain, flange and thrust. This, plus several pages of engineering data, make the catalog a handy technical reference. Kingwell Bros., Ltd.

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Spherical Roller Bearings & Pillow Blocks

All the technical information you need on spherical roller bearings can be found in this 50-page booklet. It's filled with charts, graphs and engineering formulas. Sections cover applications, bearing design, bearing selection data, load analysis, lubrication information, and shaft details. Engineers will find the formulas given under the Bearing Load Analysis section particularly helpful. Link-Belt Company.

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Heavy Duty Roller Bearings

Handy pamphlet on heavy duty roller bearings discusses their design, load capacity, lubrication and installation. In calculating load capacity two line graphs are provided for quick determination of the speed factor and life factor. Pamphlet is well illustrated with line drawings and charts for easy selection. *The Torrington Company*.

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Industrial Bearings

This 80-page well illustrated catalog is full of engineering data on all types of industrial bearings, including ball, roller and sleeve bearings. Lots of pictures, line drawings and charts make type and size selection easy. The catalog's completeness makes it an excellent reference to keep on file. Dodge Manufacturing Corporation.

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Self Lubricating Bearings

A 44-page engineering manual is available on selflubricating bearings. Well illustrated with many charts and graphs, color is used throughout the manual to emphasize various technical details. Found inside is a large amount of engineering information on properties, coefficient of friction, bearing selection, lubrication and over 12 pages alone on design data. Oilite - Kingwell Bros., Ltd.

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Precision Roller Bearings

You'll want a copy of this well illustrated 48-page reference manual on precision roller bearings. Types of bearings covered include staggered roller bearings, roller bushings, journal bearings, cam yoke rollers, cage type needle bearings, sealed cage type needle bearings, cam followers and thrust roller bearings. Charts and tables provide easy selection of types and sizes. *Orange Roller Bearing Co., Inc.*

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Ball Bearings

This 158-page handbook with leatherette binding contains all the technical data necessary for the selection and application of ball bearings for general use, including engineering information on dimensions, load ratings, load conversion factors, bearing tolerances, and shaft and housing fits. A handbook feature is the "at a glance" picture index for bearing selection and identification. New Departure Division, GMC.

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Ball & Roller Bearings

Brochure contains information on the different types of ball and roller bearings in the industrial field. Each type is discussed as to its usage and is complete with photograph and accompanying line drawing illustrating its design feature. The brochure is a useful one to help determine what general type of bearing to use. SKF Industries, Inc.

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Precision Ball Bearings

This useful booklet on precision ball bearings describes bearing characteristics such as materials used, construction, retainers and shields. An easy selection guide in chart form gives typical applications, bearing characteristics, construction and bearing series. Booklet is well illustrated and designed for quick reading and fast selection. The Barden Corporation.

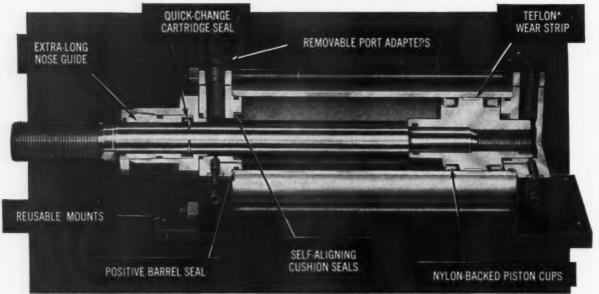
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Transportation Bearings

An excellent special purpose booklet that describes the different types and uses of roller bearings on railroad products. Well illustrated, it contains charts and pictures and discussed the use of each type of bearing. In addition it discusses a traction motor bearing inspection and service program based on the bearing company's inspection that has proved to be a money saver. SKF Industries, Inc.

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> . . . for more details, circle No. 24 on Reader Service Postcard WESTERN INDUSTRY/DECEMBER 1959

Special Anti-Friction Bearings

Here is a 24-page brochure containing a lot of technical information on custom engineered bearings. Among the data covered are special shapes and sizes, extreme temperature range, corrosion resistant, non-magnetic, accuracy, electrically insulating or conducting, and large sizes. Some 24 typical bearing designs are shown and illustrated by line drawings. *Industrial Tectonics, Inc.*

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Precision Bearings

Send for this 68-page size and capacity handbook on precision bearings. Types covered include: full type roller bearings, full type guided roller bearings and cage type needle roller bearings. Many charts and graphs provide technical data in quick reference form and make bearing selection easy. A handy reference for your engineering file. McGill Manufacturing Company.

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Booklet Series on Bearings

Here is a series of four booklets on ball bearings, each of which is full of technical information. Booklet No. 1 covers basic ball bearing types and discusses the use of each. In No. 2, seals, separators and lubricants are covered, and each example, illustrated. No. 3 is on bearing failure identification and tells how to identify and understand the causes to apply proper corrective measures. Booklet No. 4 deals with bearing maintenance, including preventive maintenance, installation procedure, mounting methods, bearing removal and lubrication. New Departure Division, GMC.

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Powdered Metal Bearing Selection Chart

Here is a handy selection chart for powdered metal bearings. Suitable for notebook insertion this 11x16 in. chart may also be placed on the wall. Tells bearings' chemical content, oil content, and cost and shows at a glance how each reacts under different conditions of shaft rotation, and load. In addition it gives heat range, noise level and machinability of each type of bearing material and its application recommendation. Bound Brook Oil-Less Bearing Co.

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Ball Bearing Service Manual Series

A matching set of five service manuals which every engineer will use. This series is full of technical information and "how to" data. All five manuals are well illustrated and points discussed have accompanying pictures. Part 1 deals with bearing application and covers the principal ball bearing types and fundamentals of mounting. Part 2 is on details of design and gives information on shafts and housings for ball bearings. Part 3 covers enclosure and lubrication of ball bearings for various services. Part 4 tells how to compute bearing load. Part 5 deals with application procedure and is a brief outline of the principal steps in developing the bearing mounting. New Departure Division, GMC.

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Self Aligning Roller Bearings

This 36-page brochure on self-aligning roller bearing units is full of engineering data on bearing design and construction. Radial load rating tables are provided that cover normal duty, heavy duty and adapter type units. Brochure is well illustrated having both pictures and line drawings. Technical information also is provided on advantages of self aligning design. Shafer Bearing Division, Chain Belt Co.

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Oil Less Bearings

To complete your engineering file you will want to send for this 20-page booklet on wood impregnated bearings which have applications on screw conveyors, conveyors of all kinds and as rollers. Booklet describes method of manufacture, shows typical installations and applications, and gives dimensional and installation data on hanger bearings. our pages of engineering information covers press fits, clearances, and speeds and loads. Arguto Oilless Bearing Company.

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Dry Lubricated Bearings

This pamphlet discusses oilless bearings composed of plastics dry lubricants and other additives. Charts and graphs give bearing properties and show results of laboratory tests made with various different materials in comparison with molded alloy plastics. Applications are shown and features of the bearings described. Arguto Oilless Bearing Company.

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Bronze Bearings

This brochure deals with high lead bronzes and babbitts for use in bearings and bushings. A considerable amount of technical information is provided on the chemical and physical properties of the metals and their various uses. Included are running specifications, recommended unit loads, and S.A.E. bronze specifications. Typical case histories are also shown. The American Crucible Products Co.

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Roller Bearings

The brochure describes and gives detailed information on different types of roller bearings including precision radial, precision thrust, steel cage, flexible flange, cartridge, and traction motor bearings. Each type is well illustrated and the features and applications discussed. Maximum and minimum sizes are also given. Rollway Bearing Company, Inc.

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Commercial Roller Bearings

Here is a pamphlet on commercial type roller bearings and bearing boxes for use where a high grade bearing is not necessary. The rollers in the bearing are not hardened and operate directly on the shaft. A description is given of this type of bearing including its advantages and construction details. Charts are provided for each style making it simple to determine bearing selection. Royersford Foundry & Machine Co.

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HELPFUL LITERATURE

FOR THE WEST'S PLANT OPERATING EXECUTIVES

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CIRCLE APPROPRIATE KEY NUMBERS ON POSTCARD, P. 83

DATA AND DIMENSIONS FOR NEW SUSPENSION SCALE

All pertinent dimensions and complete prices for a new suspension scale are provided in a giant full color card that also gives you shipping data. Further technical information, specifications and design features are contained in the accompanying eight-page bulletin that shows you nine action-shot case histories of the weighing equipment in use. W. C. Dillon & Co. Inc.

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SELECTION GUIDE, PRICE LIST FOR BIG STOCK OF SOLENOID VALVES

Here, at your fingertips, is selection and price data for what's called the world's largest stock of solenoid valve stocks for immediate delivery. It's contained in a 16-page catalog that groups valves under specific types-2-way normally closed; 2-way normally open; 3-way; 4-way, manual reset and special purpose. Valve pipe and orifice sizes are numerically listed under each type, together with maximum pressure ratings for fluids and gases. Additional technical data deals with continuous duty coils and voltage range, flow coefficient formulas and solenoid enclosures. Automatic Switch Co.

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FACTS AND PHOTOS ABOUT AIR-POWER STAPLER WITH NO RECOIL

Cutaway views and light pattern photos highlight this manual about a new air-power stapler that makes possible continuous high-speed production line stapling. The photos point out the air return feature and the light path bounce of the device. Data and pictures of other staplers in the line are included in the booklet. Signode Steel Strapping Co.

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48-PAGER GIVES COMPLETE STORY ON SANDBLASTING EQUIPMENT

A really complete sand-blasting manual-said to be the most thorough ever compiled by a Western company -this spiral-bound 40-pager includes everything you need and want to know about the Sanstorm pressure type blast cleaning machine and accessory line. Covering two types-closed top manual fill-plug and open top automatic fill-plug - it gives descriptions that are purposely detailed where necessary to make your choice quick and correct. Cross-sectional drawings labelled to point our pertinent features, facts on all kinds of accessories, many tables of technical data and numerous illustrations add to the book's worth. Sanstorm Manufacturing Co.

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TECHNICAL DATA ABOUT PRE-ENGINEERED SECTIONAL BELT CONVEYOR

Comprehensive technical data and advantages of pre-engineering for sectional belt conveyors are contained in this new bulletin. It features an exploded view of the conveyor with all the components pointed out. Stephens-Adamson Mte. Co.

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CASE HISTORY SHOWS YOU HOW TO INCREASE YOUR STORAGE SPACE

Action shots taken right at a plant illustrate this case history bulletin that describes handling and storage techniques for plywood warehousing. It shows how ingenious dimensional planning, plus one special narrow aisle truck, resulted in 10 carloads of extra storage capacity — plus other bonuses. All phases of the operation are described by photos and text. Lewis-Shephard Products, Inc.

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BOOKLET TAKES YOU ON PICTURE TOUR OF DIE CASTING OPERATION

All about the complete die casting service provided by a Western firm, this booklet takes you on a picture tour of the facilities, showing the conveyorized assembly department, ladling process, a cold chamber casting machine, the tool and die shop and other facets of the operation. Also illustrated are a few of the many parts—simple and intricate—produced automatically for diverse industrial uses. *Union Die Casting Co.*

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ENGINEERING DATA BOOK DESCRIBES FULL LINE OF MULTIPRESSES

General data on the full Multipress line, including that for the new R, S and T series are provided in this illustrated four-page brochure. Standard accessories, such as touch control, index tables and foil feed marker are also described in the bulletin, which lists over 30 jobs in which this equipment is used by industry. Denison Engineering Div., American Brake Shoe Co.

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SHAPES, SIZES AND PROPERTIES FOR EXTENSIVE STOCK OF NYLON SHAPES

Data on an extensive range of shapes, sizes and properties for nylon stock shapes is presented in this eight-page illustrated brochure that has information on moisture conditioning, machining, bonding and welding and coloring of nylon parts. Available sizes for rod, plate, sheet, strip and tubing are listed and typical applications shown. Physical properties of four grades are charted and chemical resistance and moisture absorption is shown for general purpose grade Cadco N-1 nylon. Cadillac Plastic & Chemical Co.

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The only one-hand strapping tools SFC Series

Power strap feeders Model PSF



Complete line of air power tensioners PN Series



Air power portable strapping machines AP Series



The first air power feed wheel tensioner for heavy duty strapping

FN Series



First compression strapping machines with built-in turntable for 2-way strapping. CSF Series



Electric portable strapping machines. AE Series



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ways to new savings

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dustry-create new ways to save with strapping. Signode will be glad to help you select the right equipment and devise methods to make the most of it. There's a Signode man near you.



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35-PAGE CATALOG PROVIDES DATA ON ELECTRICAL INSULATING VARNISH

In this comprehensive 35-pager about the selection and application of electrical insulating varnishes, you'll get complete details on all electrical and mechanical properties, as well as operating temperature limitations. Charts, graphs and illustrations on temperature conversion, viscosity and other categories pertinent to selection of insulating systems are included. Other sections deal with testing, impregnation methods and similar technical points. Minnesota Mining & Mfg. Co.

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BOOK ON HAULAGE MACHINES CONTAINS 14 TYPICAL LAYOUTS

You'll see 14 typical layouts—showing the many uses to which car spotters and car pullers can be adapted—in this 20-page book filled with engineering and selection data about haulage machines. How the two types—capstan car spotters and drum type car pullers—can be arranged in pairs or with sheaves and snatch blocks for flexibility and for complex assignments is fully described. Link-Belt Co.

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BULLETIN OF COMPLETE DATA ON SPECIAL PURPOSE CIRCUIT BREAKER

A new low impedance, 5 to 7 ampere, special purpose circuit breaker is described in this color bulletin filled with complete descriptive, dimensional and ordering information. Application data, interrupting rating and handle yoke ties tables are included, along with a dimensional outline drawing and a chart on time-current characteristics. General Electric Co.

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ONE-SHOT PUSHBUTTON SWITCH ASSEMBLIES DETAILED IN DATA FOLDER

Filled with detailed drawings, as well as product photographs, this data sheet introduces three new "one-shot" pushbutton switch assemblies that have a special circuit to produce one square wave pulse regardless of operating speed. Circuit diagram, tables, graphs of typical output pulse curves, application information, mounting dimensions, list prices and discounts are provided in its eight pages. Micro Switch, division of Minneapolis-Honeywell Regulator Co.

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48 PAGES ON EQUIPMENT FOR WEIGHING, BATCHING AND PROPORTIONING SYSTEMS

This catalog's 48 pages give you extensive information about an entire line of equipment for weighing, batching and proportioning systems. One 11-page section is devoted to six types of constant weight feeders. Equally complete data is provided for vibrating conveyors, coolers and dryers, separators, vibrating screens and related equipment. Application, specifications, installations and operation are detailed. The Jeffrey Manufacturing Co.

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ALL ABOUT FAST HANDLING OF 10,000-12,000-LB. LOADS

You can learn how to achieve fast, low-cost handling of 10,000 to 12,000-lb. loads from this 12-page brochure about the Challenger 100-120 series lift trucks, first models specifically engineered for handling loads in that range, rather than modifications of heavier or light range. Dual-range power-shift transmission, short turning radius, fast lift speed and a wide selection of options, attachments and accessories are some of the advantages detailed in the booklet. Hyster Com-

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INDUSTRIAL CONTROLS CATALOG FILLED WITH TECHNICAL DATA

Combining information from several other catalogs, this manual lists many products such as automotive temperature, pressure, level and flow controls; counters, switches and automation controls; actuators, control indicators and others. It provides much technical data for these as well as for relays, transformers and time switches of several types. General Controls Co.

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CATALOG DESCRIBES ROLLER BEARING SERIES WITH ONE-PIECE CAGE DESIGN

This six-page foldout catalog provides you with all the details of a patented one-piece cage design featured in the HJ series heavy duty roller bearings. Technical information includes data on load capacity, lubrication and installation, while a two-page table provides facts on dimensions, weight, capacity, etc. The Torrington Co.

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SIMPLIFIED GUIDE FOR SELECTING

In this simplified selection guide about cold finished carbon steel bars you'll find stock sizes and shapes of more than 20 different kinds, including Ledloy 375, the fastest machining steel available. Comparative data on strength, workability, machinability, heat treatment, response and cost are included. Important differences between drawn, turned and ground bars are discussed, along with how to buy most economically. Joseph T. Ryerson & Son, Inc.

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IDEA BOOK SHOWS HOW COUNTERS CAN MAKE YOUR PRODUCT EASIER TO SELL

How the inclusion of counting devices in the design of machinery can bring you competitive advantages is explained in this eight-page folder filled with technical data on a number of counters. Revolution, geared and ratchet counter are fully described, as well as types that feature high speed, reset, lineal measuring, remote data readout and other qualities. Veeder-Root, Inc.

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DETAILS ON INDUCED DRAFT COOLING TOWERS WITH CENTRIFUGAL TYPE FAN

Construction, specification and performance details for cooling towers with a centrifugal-type fan for quiet indoor/outdoor operation are contained in this new bulletin. Particular attention is given to the fan, the motor, mounting base and V-belt drive, Z-formed eliminators, wetted deck surface and the one-piece welded sump pan. Photographs, drawings and tables give valuable technical information. American Air Filter Co., Inc.

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24-PAGE BULLETIN INTRODUCES FRICTION CLUTCH OBI PRESS LINE

Covering a new line of inclinable presses, this 24-page bulletin gives a complete description of standard and optional features, specifications, die space dimensions, strokes and shut heights. The open back presses feature an instant engaging, low inertia friction clutch and brake. Niagara Machine & Tool Works.

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The cement industry also comes to National Supply for special steel products



This kiln tire, a ring casting, weighs 13 tons and has a diameter of 13 feet. It is typical of the many large, specialized steel products National manufactures for West Coast industry. These include such items as: a cylinder assembly for a 3,850-ton extrusion press, propulsion shafting for shipbuilders and a 12,000-pound stainless steel forging for the San Diego aqueduct. If you need help with special castings, forgings or machinery operations, National's Torrance Plant probably has the answer to your problem.

National has the largest integrated machinery-making plant in the West!

National Pressed Steel Forgings . Billets and Large Bars . Steel Castings and Special Machinery .

- Melting . Forging . Casting . Machining .

Heat Treating . Assembling . Welding . Testing



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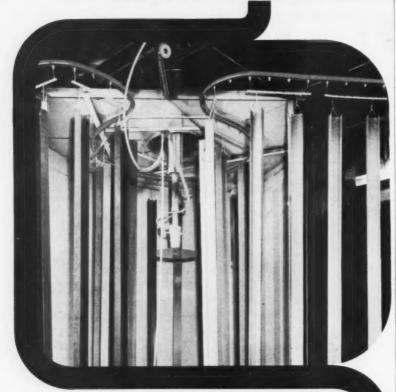
Subsidiary of Armco Steel Corporation



Torrance, California . Los Angeles Area

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CHAINVEYOR CUTS FINISHING COSTS!



This plant installation demonstrates how modern materials handling is effectively applied to new product finishing methods. A Chainveyor overhead system carries lighting fixtures through automatic de-greasing and phosphate coating booths and then in to a booth where paint is applied electrostatically. Continuing along the conveyor line the fixtures are then transported to and through the bake oven completing the entire processing cycle without any manual handling. The result is better quality work — done faster and at lower cost! Any business — and almost any plant operation — can benefit from the amazing versatility of Chainveyor when applied to overhead storage, fabricating, assembly, finishing, inspection and handling of loads up to 120 pounds.

For further information about Chainveyor systems, engineered for economical materials handling, write:



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PROPERTIES OF TWO AIRCRAFT STEELS PRESENTED IN 24-PAGE BOOKLET

Detailed information on two aircraft steels as to their mechanical and physical properties at various temperatures is furnished in this 24-page booklet that includes sections on heat treating, fabrication — including forming, forging, welding, brazing and machining. Numerous tables giving further technical data are included in the booklet which covers AM-350 and AM-355 steels and gives a host of applications for the two in addition to their present use in the aircraft and missile fields. Allegheny Ludlum Steel Corp.

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NEW MANUAL FEATURES FULL LINE OF GAS WELDING, CUTTING GEAR

A new manual featuring a full line of gas welding, cutting and allied equipment includes several illustrations to show equipment in proper size relation. In addition to equipment pictures and description, the manual carries charts and technical data on the various items. A section is devoted to flow capacity curves for the company's line of gas pressure regulators. Smith Welding Equipment Corp.

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FOLDER DESCRIBES THREAD ROOT FORM FOR SOCKET HEAD CAP SCREWS

A recent advance in industrial fasteners is the subject of this four-page folder that uses photoelastic studies to depict the change from the old flatroot thread form to the controlled thread root form with larger, more uniform root radius of concave configurations. Lab tests results of cycle life under various stress conditions are listed and other technical data provided, as well as a large labeled photo of the screw. Standard Pressed Steel Co.

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TECHNICAL, ENGINEERING DATA ON BIN LEVEL CONTROL SWITCHES

You'll find specifications, diagrams, illustrations and much technical and engineering data in this bulletin about "Tellevel" bin level control switches. The publication covers normal duty explosion proof and heavy duty types of switches. Stephens-Adamson Mfg. Co.

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ALL ABOUT 4-VEHICLE SERIES OF HEAVY-DUTY ELECTRIC TRUCKS

New features and specifications of four vehicles in the R-10T series of heavy-duty industrial trucks are highlighted in this six-page booklet. A set of drawings keyed to a table of specifications shows you wheelbase, turning radius and lifting height of each model. Other data deals with design of axles, motors, controls and brakes of the trucks, which are from 6,000-10,000-lb. capacity. The Elwell-Parker Electric Co.

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TUBING, PIPE BULLETIN TABULATES DATA ON CORROSION RESISTANT ALLOYS

Filled with tables, this six-page bulletin deals with tubing and pipe made of Hastelloy alloys B and C, outlining applications of these supercorrosion resistant alloys and describing their resistance to corrosive fluids. Tabular data includes chemical analysis and properties of the two alloys, size ranges and tolerances. Another section of the cardboard fold-out deals with workability. The Carpenter Steel Co., Alloy Tube Div.

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INFORMATION ON HYDRAULIC SHEARS

The new line of Steelweld Hydraulic Shears with pivoted-blade action is fully described. The highly illustrated booklet that provides construction details and specifications on the shears, which are available in all sizes for cutting metal in lengths to 30 feet and in all thicknesses to two inches. Cleveland Crane & Engineering Co.

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FACT SHEET DEALS WITH WET AND DRY BULB SYSTEMS, ACCESSORIES

Wet and dry bulb thermal systems and accessories used with filled-system thermometer-psychrometers are detailed in this four-page sheet. It includes bulbs, tubing and accessories; water supply accessories for wet bulbs—wick and tank, or porous tube—and suction fans. Recorders and electric and pneumatic control models available for relative humidity are also listed. Minneapolis Regulator Co., Industrial Div.

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NEW DEVELOPMENTS in Signature of the second second

HIGH VACUUM PUMPS AND EQUIPMENT

LOWERED SILHOUETTE AND ADVANCED PERFORMANCE Compact design is well illustrated

Compact design is well illustrated in the new KINNEY KDH-65 single stage Pump shown at the left. This Pump, with 3 hp motor and free air displacement of 65 cfm attains ultimate pressures to 10 microns. This same Pump, with 5 hp motor, provides free air displacement of 80 cfm and attains the same ultimate pressure as the KDH-65. Product development of this sort marks the entire KINNEY Pump line, assuring for you ever higher standards of pumping economy and smooth performance.



THERMOCOUPLE GAGE FEATURES NEW COMPENSATED TUBE

This new gage spans the range from 3000 microns to 1 micron with accuracy of \pm 10% at mid-scale. It is available in 3 models covering 1 to 6 stations. No need for "matching" tubes . . . you can change a tube among a number of tubes in one circuit, as well as from circuit to circuit. Descriptive bulletin on request.



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SIX PRACTICAL TIPS ON ULTRASONIC CLEANING GIVEN IN SERVICE BULLETIN

Practical tips on ultrasonic cleaning are the topic of this service bulletin that describes the process by which high frequency sound waves impart intense scrubbing action to solutions to speed precision cleaning. Effective compounds for the cleaning solution and the types of operation that this relatively new cleaning does best are also discussed. Oakite Products, Inc.

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DATA ON BABITTED AND BRONZE BEARING BLOCKS AND TAKEUPS

Divided into two sections, one for bearing blocks and the other for takeups, this 16-page book gives you complete information on babbitted, bronze and plain bore blocks and takeups, including 119 new sizes in eight series. Design features, illustrations and descriptions of each, and its class of application are provided, as well as dimensions, weights and diagrams showing recommended loading ranges. Link-Belt Co.

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56 PAGE IDEA BOOK ON OVERHEAD HANDLING

This 56-page catalog features engineered overhead handling systems of track, cranes, trolley, switches, and other electrification, as well as monotractors and auxiliary equipment, covering both prime lines: Railmaster (heavy duty) and Standard (light duty) monorail systems. It's an idea book listing hundreds of applications in many industries, and processes within industry, such as handling of bulk materials, steel and wire, and several shipping operations. The American MonoRail Co.

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CATALOG GIVES SPECIFICATIONS FOR TAPERED ROLLER PILLOW BLOCKS

Load ratings, specifications, shaft sizes and comparative block sizes are given in this catalog about malleable tapered roller pillow blocks. Features such as eccentric locking collar, labyrinth grease seals and elongated bolt holes are described and illustrated. Browning Manufacturing Co.

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BOOKLET TELLS WHY SILICONE-INSULATED RUBBER CABLE PAYS OFF

You can compare for yourself the properties of electrical grade silicone rubber used for insulating cable with other types of insulation. The comparison data is presented in a graphic chart and further explained in the text of this illustrated bulletin. The publication also discusses major application areas in which silicone insulated cable has proved its performance, and points out lowered installation costs possible. Several pictures and charts add to booklet's message. General Electric

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TECHNICAL DATA SHEET DESCRIBES VERSATILE ELECTRONIC SWITCH

This data sheet tells you all about a new electronic switch that turns lights on at dusk, off at dawn automatically. Only 134 in. in diameter, it's sealed in a moisture proof case, cannot be activated by headlights or other light flashes. Technical data includes specifications such as sensitivity, capacity, temperature range etc. A detailed diagram is provided for three models. Schacht Electronic Mfg. Co.

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CATALOG COVERS OVER 1,000 CHEMICAL PRODUCTS AND THEIR USES

Specifications, end-uses and other technical data for the more than 1,000 products made by this chemical firm are listed in this 36-page, two-color catalog. The products are reviewed in the general areas of basic chemicals. monomers, polymers, resins, adhesives, coating materials, plastic products, fine chemicals, organic intermediates and bio-chemical reagents. The directory is cross-indexed by product name and end-use. The Borden Chemical Co.

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12-PAGE ROUNDUP OF EQUIPMENT USED BY THE PROCESS INDUSTRIES

Here's a quick but panoramic view of equipment for the process industries-feeders, conveyors, coolers, dryers, bin check valves, magnetic separators and the like. Its 12 pages outline the entire line, but you can also get specific catalogs for each unit described in this general book. The Jeffrey Manufacturing Co.

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INSERT THE RIVET IN THE PRE-DRILLED HOLE. Bring the rivet to the work . . . not the work to the fastener. No lock washers or jam nuts are required. INSTALLED COSTS ARE jam nuts are required. INSTALLED COSTS ARE LESS than any other type of fastener requiring a pre-drilled hole.



AND SQUEEZE. The "POP" rivet "pops Into place." Being a hollow "blind" rivet, the "POP" Rivet clinches from the head side only ... you can place the rivet anywhere ... even in those hidden areas because "back-up or bucking" is eliminated.

HUGE INVENTORY AND SERVICE CENTER The Universal Melding Company maintains a very complete steek of sizes and styles of "POP" Rivet tooling. In addition, Universal also offers the only "POP" Rivet repair in Southern California.

Phone or write for complete information. A Service Engineer will be happy to demonstrate the many uses of "POP": Rivets anywhere in Southern California.

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ENGINEERING BULLETIN DETAILS POST-TENSIONING FOR PRESTRESSED CONCRETE

In this 16-page engineering bulletin about post-tensioning for prestressed concrete are described force development calculations, detailing and placement plans, tendon and anchorage assemblies and field labor procedures. Detailed drawings show proven methods of post-tensioning. Buildings, bridges and other structures made possible with prestressed concrete are shown. Joseph T. Ryerson & Son, Inc.

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12-PAGER GIVES TECHNICAL DATA ON LINE OF PUMPS

You'll find complete product descriptions, dimensions, application data and performance characteristcis of a line of pumps in this 12-page bulletin. The pumps are available in both packed and sealed types in sizes from 11/2 through 4-in. discharge, with the packed type also available through 8-in. discharge. Capacity and head ranges of both types, temperature limit and motor sizes are also provided. Peerless Pump Division, Food Machinery & Chemical Corp.

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FULL DATA ON HELIARC LINE OF MANUAL WELDING EQUIPMENT

The complete story on Heliarc manual welding equipment is given in this 20-page catalog that illustrates every manual torch in one-half actual size. Accessories are described in the torch section and listed separately in handy table form. You'll also find complete ordering data for the equipment, suitable for manual welding of all commercial metals from thin-gage to 1/2in. thick. Linde Co., Division of Union Carbide Co.

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12-PAGE MANUAL DESCRIBES MASS SPECTROMETER LEAK DETECTOR

Operating principles, features and application data of a new mass spectrometer leak detector are discussed in this 12-page brochure. It includes information on maintenance features. installation and consultation services, and optional accessories for the highaccuracy detector for locating leaks in vacuum and pressure systems. General Electric Co.

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PAMPHLET DESCRIBES SPECIAL SMOOTH I. D. CYLINDER TUBING

Jal-Smooth, a new drawn-overmandrel electricweld tube, is the subject of this illustrated pamphlet that gives O. D. and I. D. tolerances, microinch finish of the I. D., mill test pressure and burst pressure psi. for the cylindrical cylinder tubing. Brief facts on the manufacturing process. quality control and testing methods followed in production of special smooth internal diameter tubing are included. Electricweld Tube Div.. Jones & Laughlin Steel Corp.

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16-PAGE CATALOG DEALS WITH PRE-ENGINEERED BLOWER HOUSINGS

In this 16-page catalog about preengineered blower housings for blower wheels you'll find dimensional specifications and prices for all standard model housings and components. The catalog deals with wheels ranging from 3- through 11-in. diameters that are completely adaptable to any width single- or double-inlet wheel. Detroit Stamping Co.

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24-PAGE BROCHURE TELLS ALL **ABOUT GAMMA RADIOGRAPHY**

Gamma radiography - its background, applications, safety and definitions, selection of sources and equipment, and methods of exposure-is the subject explored in this 24-page brochure. The illustrated booklet also has sections about typical radiographs and what they show, a complete description of the firm's radiography equipment, and related equipment and services. The Budd Co., Nuclear Systems Div.

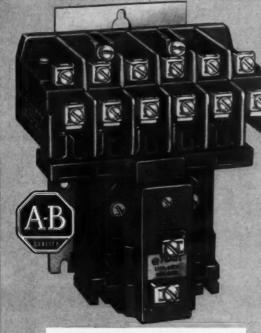
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48-PAGE CATALOG DESCRIBES VARIETY OF SCIENTIFIC AND TEST INSTRUMENTS

In this 48-page condensed catalog about scientific and test instruments you'll find a brief description, typical illustration, specifications and reference to additional data for each family of instruments. It deals with amplifiers, data handling systems, lab and calibration instruments, servo components, oscillographs, transducers and other equipment for measurement, recording and testing. Minneapolis Regular Co., Industrial Div.

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IT'S NEW



Bulletin 700 Type BR Relay with all six of the convertible poles arranged for normally open contact operation.

Allen-Bradley
Convertible
Contact
CONTROL RELAY

BULLETIN 700

TYPE BR

Changeover made in seconds!

The contacts of the new Type BR relay can be arranged for either normally open or normally closed operation—and any changeover in the field can be made in seconds. A screwdriver is all that's needed.

This new A-B Bulletin 700 Type BR relay is ideal for use on automatic machines where control functions are frequently altered to meet production changes.

Quick convertibility of the contacts enables easy "on-the-spot" changes—from "normally open" to "normally closed"—or vice versa.

These new Bulletin 700 Type BR relays have been exhaustively tested to make sure that they will provide

the many millions of trouble free operations for which all A-B controls are famous. In fact, the Bulletin 700 Type BR relays will establish new standards for long relay life and "reliability" of contact operation. Of course, they have double break, silver contacts that never need attention; also, the cast-plastic coil is impervious to the most severe atmospheric conditions.

Please write for full details, today!



Two extra convertible poles can be easily added—in the field

An auxiliary convertible contact pole—having full switching capacity—can be easily added to the left and right sides of the Type BR relays. These auxiliary poles are front-mounted and can be added without disturbing the wiring of the relay—and without removing the relay. All relays are designed to also accept stab connectors, and—all terminals are accessible from the front.

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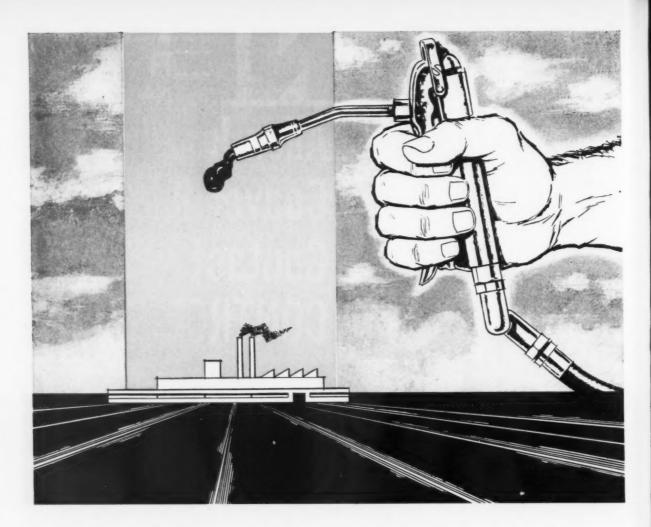
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NEW EQUIPMENT

FOR WESTERN PLANT OPERATION, PRODUCTION AND MAINTENANCE



USE RIP OUT POSTCARD, PAGE 83, FOR MORE INFORMATION ON PRODUCTS DESCRIBED

CORRUGATED METAL HYDRAULIC HOSE
. . . flexible, multiple ply for severe environments

This new multi-metal hose, known as RF-69, will withstand a temperature range of 450 to plus 1,200 deg. F., and is designed to stand up under cyclic hydraulic shock loading at peak impulse pressure of 4,-500 psi. High flexibility coupled with high strength derived from multi-ply construction, combination of materials and the tube wall configuration enables it to meet elevated pressures and advancing hydraulic impulse



requirements. The hose takes standard end fittings, presently is available in sizes from ¼ to 1¼ in., with larger sizes planned. Flexonics Corp.

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CLOTH TUBE DUST COLLECTOR
... for high temperature fume and dust control

For use with glass filter fabric, this cloth tube collector performs equally well with any type of filter fabric. Dust is collected on inside surfaces of filter tubes, which are cleaned by the pressure-jet method. Intensity of action may be regulated from slight pulsation to what equals a mechanical shaking. Adaptable to most any application, this collector is particularly effective in problem areas such as high temperature drying, foundry cupolas, metallurgical furnaces, carbon-black recovery and cement kilns. Pangborn Corp.

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EXTRA HEAVY-DUTY SABRE SAW
. . . runs at 3,600 rpm., cuts full two-in. lumber

A powerful tool for hard, steady work, this sabre saw has a 16% more powerful motor than the heavy-duty model. It has full ball and needle bearing construction, a chrome-plated base for smooth sliding over work surface, and is perfectly balanced with almost no vibration. The saw comes with four blades for wood, metal, flush and right-angle cut-



ting, is also available as a complete kit. Stanley Electric Tools, division of The Stanley Works.

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AIRLESS SPRAYING SYSTEMS

. . . for in-plant and maintenance painting

Offered in two basic types, a 55-gal. and a 5 to 10-gal. outfit, these airless spraying systems may be operated from plant compressed air system or from a portable compressor. Paint is taken from original container through a high pressure pump that delivers working pressures up to 3,000 psi. when necessary and supplies enough material to supply two spray guns if needed. Each unit comes with nylon pressure fluid hose with reusable fittings, or may be ordered with stainless steel hose. Binks Mfg. Co.

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FORK TRUCK WITH PAPER ROLL GRAB
... attachment combines clamping, rotating functions

With a new 180-deg. rotating paper roll grab attached to the Model J sitdown ridertype fork truck, a roll range of 23 to 40 in. in both horizontal and vertical positions can be handled. Designed to fill diverse requirements of the paper industries, it makes a single integral paper roll handling unit. The 180-deg. rotation allows operator to set roll on either end, and the thin arm design makes it possible to break out ver-



tical rolls from very tightly stacked freight cars and warehouses. Lewis-Shepard Products, Inc.

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LARGE-CAPACITY GAS METERS
...light-weight, single joint aluminum models

Addition of these two new meters, the "3,000" and the "10,000," completes a line of meters in every capacity rating needed for industry or homes. Both provide weight advantage and rugged construction ideal for operations where large volume loads at high pressure are needed. The larger one has a working pressure of 100 psi., yet weighs only 310 lb., while the "3,000" has the same pressure and weighs but 100 lb. Single joint construction makes repairing easier; one-unit inner mechanism simplifies maintenance. Rockwell Mfg. Co.

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SOLID CARBIDE FLUTED TOOLS . . . burs, internal grinding tools, drills, routers

In this new line are included burs of 46 shapes and sizes up to ½-in. diameter with six cutting surface types; 17 sizes of internal grinding tools; and 10 sizes of boring tools. Reamers with straight, right and left hand spiral flutes are sized from 1/16 to %-in. diameter. Flat drills, drill and countersink combinations range up to ½-in. diameter and standard spiral drills, the same, and in 60-wire gage sizes. Routers include profiling single flute series and two flute straight router mills. Kennametal, Inc.

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CHEMICALLY INERT CROSSES ...standard fittings in process piping line

Lined with Fluoroflex-T, a non-porous compound made from tetrafluorethylene resin, these Type S crosses are immune to all acids, caustics, chlorides, solvents, etc., at all concentrations from minus 100 to plus 500 deg. F. The liner extends over full gasket face of the four flanges to provide a uniform continuous barrier against corrosive fluids. Sizes now available



are 1 to 6 in.; sizes to 8 in. will be available later. Resistoflex Corp.

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GENERAL PURPOSE PUMP . . . self-priming, with more flow—less horsepower

Said to deliver more flow over a wider range of pressures and require less horsepower, size and weight than other types of pumps, these Transflo ball pumps have no built-in drag to cause difficulty when starting, reversing or running dry. Nylon rotor and vanes are not affected by any ordinary fluid, are highly recommended for water, gasoline, solvents and all types of oil. Positive displacement pumps, they will prime instantly with suction lifts exceeding six feet. *Transflo Corp.*

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BULK SODIUM CHLORATE CAR . . . for easier, quicker more economical unloading

This car has two compartments with sloping sides and floor pitched to the single outlet connection. Water, or recirculating solution, is introduced into a specially designed rotating vertical jet pipe mounted over the discharge outlet, so that chlorate is rapidly slurried and dissolved and the car is completely, quickly emptied. Top of car is flat for safe walking; eight large hatches provide easy access and inspection. Compartment lining is of smooth, corrosion-resistant material. Pennsalt of Washington Div., Pennsalt Chemicals Corp.

. . . FOR MORE DETAILS, CIRCLE NO. 259

THREE-SPEED RIDER-WALKIE TRUCK . . . two speeds with fingertip control, third by foot treadle

For faster material movement at less cost, this new worksaver features a new parallel electric motor which runs off a single 12-v. battery, provides a top speed of 6.3 mph. Simplicity of the motor and the battery with less expensive charger cuts initial cost of the lift truck, while the motor's efficiency reduces power losses by as much as 33%. The third-speed actuating mech-



anism is a safety device, since it requires operator to ride the truck. Yale Materials Handling Div., The Yale & Towne Mfg. Co.

. . . FOR MORE DETAILS, CIRCLE NO. 260

LOW-COST ELECTRO-MAGNETIC COUNTER ... six-wheel type with maximum constant speed rating of 700 per min.

Dimensions of this new six-digit counter are 2.092 x 2.401 x 2.250 in., including the 4-hole mounting flange or base. Operating on standard 115 v. a-c., or on other voltages on special order, power consumption is approximately six watts. Wheels are white, die cast metal, with black .188 in. high characters. It's for use where there's a need for a low speed, limited life unit of minimum initial cost, yet having rugged reliability. Veeder-Root Inc.

. . . FOR MORE DETAILS, CIRCLE NO. 261

FOLDING-STACKING BOXES . . . complete units without small parts, need no tools for set-up

A keyhole locking device, hinges so that all four sides can be folded, and safety pockets on corner posts for rigid support are some of the design features of these corrugated folding-stacking boxes for storing and shipping. When folded, four boxes occupy space equivalent to one box containing materials; this permits up to 80% savings in transportation charges. Palmer Shile Co.

. . . FOR MORE DETAILS, CIRCLE NO. 262

24-in. WOOD PLANER . . . with one-piece frames and table, safety release bar

This single surface wood planer features ball bearings on all shafts and pulleys, bronze bearings on rollers and handwheel, table raising handwheel with left front mounting, lifting holes on top of side frames, readily adjustable motor mount in the base, heavy duty V-belt drive and many other improvements. Extra safe, it has quick release bar that with slight pressure any-



where instantly stops feed rollers. Max Manufacturing Co.

. . . FOR MORE DETAILS, CIRCLE NO. 263



School lighting fixtures that reduce lighting costs one third Send for free booklet! Write for: "Bringing New Benefits To Stores and Offices." 40% sales increase! Worker's efficiency up $5\frac{1}{2}$ %.



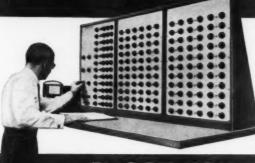






Factory lighting fixtures that do a superior lighting job with low initial cost plus low maintenance.

Rugged, modern outdoor lighting. Special lighting consultants are available without obligation.



SMOOT-HOLMAN'S ADVANCED DESIGN ANALOGUE COMPUTER* is able to solve numerous and complex lighting problems. It scientifically determines specifications for illumination and fixtures that will deliver unsurpassed performance in each situation.

*Smoot-Holman Exclusive! Only computer of its type used by a lighting manufacturer.

SMOOT-HOLMAN COMPANY Inglewood, California





with MASTER Fume Separator

Don't take chances with fumes. Whether merely unpleasant or highly toxic, fumes are dangerous. New Master Fume Exhausters give maximum performance at lowest cost with highest efficiency. Exclusive super water-intimacy system assures safe discharge with minimum water and power consumption. Expensive sheet metal construction is eliminated. Sizes for 1500 to 12,000 CFM.

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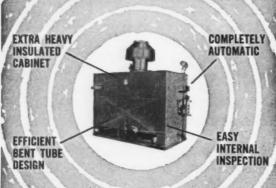
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PARKER Industrial BOILER

Gas, Oil and Gas-Oil Combination Models from $1\frac{1}{2}$ to 125 h.p.

FULL STEAM PRESSURE IN LESS THAN 10 MINUTES



Write for our Free Illustrated Booklet and name of Nearest Dealer

PARKER BOILER MFG. CO.

2035 East 37th St., Los Angeles 58, Calif.

ADams 3-8263

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BRIGHT COPPER CYANIDE PROCESS

. . . offers smooth, bright desposits over wide temperature range

Characteristics of this new process, called Copper-lume, include good metal distribution and simple operation and control. Deposits can be buffed with ease if required, do not require activation before subsequent nickel plating. Bath constituents can include either potassium salts, a mixture of potassium and sodium salts, or sodium cyanide only. Hanson-Van Winkle-Munning Co.

. . . FOR MORE DETAILS, CIRCLE NO. 264

HIGH SPEED TAP-TOOL
. . . with finger tip control head

Designed for precision tapping 0-80 to 4-40 holes in steel, this tap-tool has control of the tapping operation through the knurled collar just above the tap, requiring only light pressure. Tap can be cleared as necessary by the rapid reverse control and head is readily adaptable for through or bottom tapped holes. Powered by standard drill press, the tool can tap 0-80 holes at the rate of



10 per min. Armite Laboratories.

. . . FOR MORE DETAILS, CIRCLE NO. 265

10-JET LUBRICATOR

. . . for chainless conveyor trolleys

Providing more positive and thorough lubrication than with mist-type oilers, this jet lubricator accurately directs oil into wheel bearings and joints with minimum loss or dripping. Designed for the eight wheels and two ball-and socket joints of chainless conveyor trolleys, it operates under about 40 lb. air pressure. Each of the 10 jets is properly positioned at the factory. Conveyor Division, The American MonoRail Co.

. . . FOR MORE DETAILS, CIRCLE NO. 266

STRAPPING TRUCK AND COIL HOLDER ...heavy duty steel with double-binned style seal box

Made of all-welded tubular steel, this light model is a fully self-contained portable strapping station that can be wheeled right to the work. Ten-inch rubber wheels and flared handles increase handling ease and stability. Guide rods easily repositioned for various widths of steel strapping are



a special feature; rods are set at an angle for greater efficiency. Acme Steel Co.

. . . FOR MORE DETAILS, CIRCLE NO. 267

EPON-BITUMEN COATING

. . . one-coat, inexpensive coating for pipe, other metal equipment

Especially suited for use as a low-cost corrosion-resistant coating for pipe and other metal equipment and on concrete surfaces, this new coating also has excellent adhesion, toughness and resistance to water. It's based on EPON 828 and Bitumen C, a compatibilized bitumen, has greater chemical resistance than existing epoxy-coal tar enamels. Two-month immersion tests showed it to be unaffected by many acids and other corrosive materials. Shell Chemical Corp.

. . . FOR MORE DETAILS, CIRCLE NO. 268

TOW CHAINS
... all purpose type, for light duty in warehouses, plants



Drop-forged grab hooks on these tow chains hold securely when they are looped into one of the chain links. Four styles and sizes of the bright zinc plated assembly are 14 ft. of 3/8 in., 14 ft. of 4/16 in., 12 ft. of 1/4 in., and 14 ft. of 1/4 in., all with grab hooks and packaged in a sturdy cloth bag marked with chain size and length. American Chain Div., American Chain & Cable Co., Inc.

. . . FOR MORE DETAILS, CIRCLE NO. 269

VINYL IMPREGNATED WORK GLOVE

. . . outwear cotton, many leather types by 4 to 1

Styled for soft flexing hand comfort and positive gripping action, these gloves are extremely abrasion and snag resistant, easily laundered to keep them clean and new looking for their long life. They come in both men and women's medium and large sizes, in either slip-on or gauntlet styles.



es. The Surety Rubber Co.

. . . FOR MORE DETAILS, CIRCLE NO. 270

STAINLESS CANNED PUMP MOTOR

. . . for handling corrosive, volatile or contaminated liquids

Produced in sizes from ½ to 5 hp., this motor has stainless steel liners and covers welded to form a perfect seal over each welded surface. End brackets are attached with O-ring seals, stators and completely sealed. Bearing type and material depends on the liquid being pumped, its temperature and chemical composition. Dimensions follow those of NEMA specifications for next higher horsepower at the same motor speed. The Peerless Electric Div., H. K. Porter, Inc.

. . . FOR MORE DETAILS, CIRCLE NO. 271

The second secon

For every kind of business need...

The Yellow Pages will help you find it. For window cleaning or warehousing—or almost anything you need in your business—look in the Yellow Pages of your phone book first. Shopping for a particular BRAND? Under the product or service heading, you'll find brands listed with their dealers . . . in alphabetical order. So save time—always turn to the Yellow Pages first.

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WE HOLD THE ANSWER to your stainless steel

fabricating problems That's right . . . National Tank's Blue Giant takes pride and pleasure in tackling and solving your particular steel fabricating problem. Whether your tank needs be in Oil Fields, Refineries, Chemical Plants, for Paint Manufacturing, for Water Storage or a vast number of other uses, we can handle them all. Call or write today for information and prices. LUdlow 3-1841 MANUFACTURING CO. P.O. BOX 71738 . LOS ANGELES 1, CALIFORNIA

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OIL TIGHT POTENTIOMETERS
. . . three models, complete and ready-to-mount

A single element, 2-watt potentiometer; a dual element, 2-watt, and a single element, 25-watt, model are available in this new series, all designed so they can be base or one-hole mounted. Operating knob, out - front position indicator ring and sub-panel operator are independently adjustable, permitting rapid sure alignment



of all three. Cutler-Hammer Inc.

. . . FOR MORE DETAILS, CIRCLE NO. 272

18-GAGE SHEAR

. . . weighs 6½ lb., delivers 2,500 strokes per min.

Despite its light weight, this hand-held electric shear can slice its way through 30 ft. per min. of No. 18 gage cold-rolled steel. It requires only slight forward pressure, can follow pattern lines perfectly, with the cutting blade always visible. It's equipped with a shear motor with spiral bevel gears, ball bearings, forged connecting rod, centrifugal fan and heavy-duty switch. It will handle monel metal or stainless in thicknesses up to 20 gage. The Black and Decker Mfg. Co.

. . . FOR MORE DETAILS, CIRCLE NO. 273

CONVEYOR BELT CLEANER
... spring-type, easily-installed, economically-operated

Applicable to hundreds of diverse uses, this cleaner consists of a row of thin, spring steel wiper blades, each with an individual pressure spring. Blades are perpendicular to belt surface, diagonal to travel of belt, and wipe a path clean and dry as belt passes over cleaner. As blades overlap, entire surface is wiped free



of dirt and slime. Belt wear is negligible since blade pressures on belt are low. Stephens-Adamson Mfg. Co.

. . . FOR MORE DETAILS, CIRCLE NO. 274

NEW SIZE ALL-STEEL MOTOREDUCER
. . . for output speeds to 1 rpm and horsepowers to 75

Designed for the tough jobs, this compact high horsepower drive increases the range of applications for this line, especially in lower speed ranges. It features all-steel housing, large overhung load capacity, postive lubrication, 98½% efficiency per gear mesh and extra depth high pressure angle gear teeth that are inherently stronger than ordinary helical teeth. The Falk Corporation.

. . . FOR MORE DETAILS, CIRCLE NO. 275

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from blueprint plans PUGET SOUND FABRICATES

PROCESS VESSELS



Nickel-clad caustic storage tanks for western chemical plant
. . . tailored to specialized plant and
equipment requirements.

You can save time, trouble and money and gain the dependability of over 58 years of custom fabricating experience when you call on Puget Sound as your source for process and plant equipment in steel plate and allows up to PES

ment in steel plate and alloys up to 1". Supply prints for prompt quotation on your next job.

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COLORED MATTE SURFACE TAPES

. . . self-sticking, non-reflecting, for many purposes

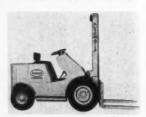
A selection of 15 colored matte surface tapes that may be written on with pen, pencil or most any standard marking device was introduced recently as part of a line of self-sticking tapes. They're available in 7 widths from 1/32 to 1 in. Other types of tape products now include plant layout symbols, border tapes, special reference design, etc., all pre-printed. ACS Tapes, Inc.

. . . FOR MORE DETAILS, CIRCLE NO. 276

PNEUMATIC-TIRED, GAS-POWERED FORK TRUCK

... new Dynamotive provides optimum torque output at lower rpm

Controlling inching characteristic of the Dynamotive drive on this electric-driven lift truck offers better operator performance, safety and lower maintenance. Full circle visibility, accessibility of seat from either side, and power steering are other advantages. With no direct mechanical coupling between engine and drive axle, trans-



mission of road shock is impossible. Automatic Transportation Co.

. . . FOR MORE DETAILS, CIRCLE NO. 277

FREE-CUTTING BRASS ROD

. . . offers closer tolerances in length and straightness

Of importance to users of high speed screw machines, the straightness of this 3 Mark Rod results in quieter operation with less machine vibration. New control of chamfer offers additional protection against feed-finger breakage. Ease of machining, high scrap value and long tool life are other advantages of the rod, available in round, hexagonal, octagonal and square. Chase Brass & Copper Co.

. . . FOR MORE DETAILS, CIRCLE NO. 278

PRECISION TEST GAGE

. . . with 12-in., 360-deg. linear dial; capacities from 15 to 60,000 psi.

For laboratory and field use, this new gage is also used in the missile industry as a substitute for dead weight testers for calibration of less accurate gages, transducers and other devices. Movement is calibrated to the dial with an accuracy of 0.15% or better. Bourdon tubes of Ni-Span C, a high nickel steel with small amounts of other elements, provide inherent

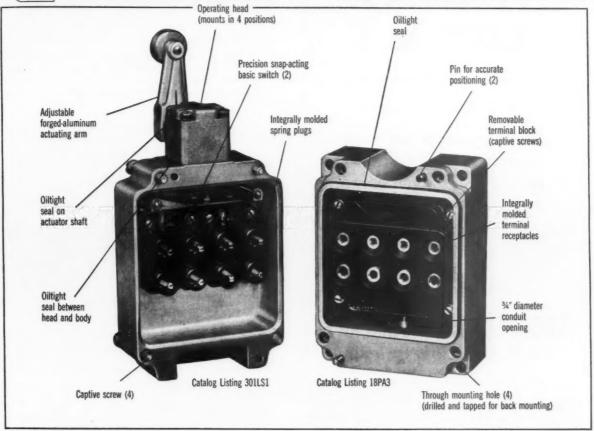


temperature compensation where it counts most. *Martin-Decker Corp.*

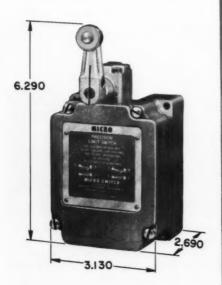
. . . FOR MORE DETAILS, CIRCLE NO. 279



MICRO SWITCH Precision Switches



This new Center Neutral "Plug-in Limit" Switch can perform the job of two separate limit switches



- Contains 2 basic switches, controls 4 isolated circuits
- Plug-in design permits fast replacement
- Oiltight construction
- Completely adjustable actuating head

MICRO SWITCH'S newest "Plug-in Limit" switch contains two double-break precision, snap-action basic switches. The lever arm operates one basic switch when moved to the left, the other when moved to the right. Neither switch is operated when the lever is in the center position.

For further details, write or call the MICRO SWITCH branch office or authorized distributor near you. Consult the Yellow Pages. Ask for Data Sheet 168.

MICRO SWITCH...FREEPORT, ILLINOIS

A division of Honeywell

In Canada: Honeywell Controls Limited, Toronto 17, Ontario



Honeywell

MICRO SWITCH Precision Switches

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"PENNZOIL'S MAXOL No. 1

Assures Smooth Performance of Profile Machines"

AIR-TEK DYNAMICS, INC. FINDS PENNZOIL'S TOP QUALITY HY-DRAULIC FLUID HOLDS DOWN MACHINE WEAR

Purchasing Agent "Mile" Gerrick says: "Maxol No. I. is stable, dependable and will not separate. We use and recommend it where hydraulic fluids are needed."

A PROVEN PRODUCT OF

THE PENNZOIL COMPANY

1630 W. Olympic Blvd., Los Angeles

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Babbilt

Adjustable SPROCKET RIM

with Chain Guide
CHANGES THAT DANGER ZONE TO A
SAFETY ZONE





The distance between the floor of your plant and your overhead valves is a DANGER ZONE when piled up boxes or even ladders are used to reach the valves.

Turn it into a SAFETY ZONE — equip your

ZONE — equip your overhead valves with Babbitt Adjustable Sprocket Rims with Chain Guides.

- They simplify pipe layout.
- They fit any size valve wheel.
 They are easy to install and operate.
- They operate any valve from the floor.
- They save time and money.
- The first cost is the only cost (no maintenance).
- They are packed completely assembled (one to a carton), with easy-to-follow instructions.
- A hot-galvanized rust proof chain is available for all sizes.

Babbitt Adjustable Sprocket Rims with Chain Guide are carried in stock by most mill supply houses. If your supplier does not carry them, contact us direct.

Babbilt

STEAM SPECIALTY CO.

BABBITT SQUARE, NEW BEDFORD, MASS., U.S.A.

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HIGH-SOLVENCY CLEANER

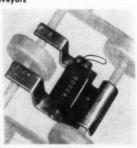
. . . for cleaning building surfaces prior to sealer application

Designed for complete cleaning of metal, glass and masonry building surfaces before applying curtain wall and building maintenance sealers, this cleaner also will easily remove wet polysulphide sealers and priming agents from surfaces and applicator tools. It will not stain surfaces because of its oil-free base, acts fast because of high solvency, and has a flash point above 80 deg. F. It's applied to a clean cloth and wiped over surface to be cleaned; surface is then wiped dry of cleaner and sealers applied. Minnesota Mining & Mfg. Co.

. . . FOR MORE DETAILS, CIRCLE NO. 280

MECHANICAL CASE COUNTER . . . for use with gravity wheel conveyors

Capable of counting up to 99,999, this counter is installed from the top of the conveyor, will fit any standard straight section or curve on 3-in. centers, except a 24-in. wide conveyor with 28 wheels per foot. A knurled knob permits resetting of counter back to zero. An arm fastened to counter shaft records each case by turning shaft when



case depresses the arm. The Rapids-Standard Co., Inc.

. . . FOR MORE DETAILS, CIRCLE NO. 281

CABLE TYPE ELECTRIC HOISTS

. . . single and two-speed models in 1/2 and 1-ton capacities

Now available in two-speed models, these cable-type electric hoists are offered in all standard voltages, with choice of several lifting speeds and various suspensions. Developed specifically to handle high speed production lifting of 1,000- and 2,000-lb. loads, they're useful where fast, accurate hoisting is necessary to keep work moving. Shaw-Box Crane & Hoist Div., Manning, Maxwell & Moore, Inc.

. . . FOR MORE DETAILS, CIRCLE NO. 282

NYLON STOP NUTS

. . . simultaneously self-tapping, locking, sealing and insulating

A one-piece, washer-faced resilient hexagon, this new Brilok nut is molded to American Standards flats width dimensions, for use of standard tools. Properties peculiar to molded nytol resin make it ideal for many equipment uses, particularly where toughness, extreme light weight, form stability at high temperatures, resistance and other qualities are desired. It locks at any position along the shank of the



screw, permitting pre-setting. Pheoll Manufacturing Co., Inc.

. . . FOR MORE DETAILS, CIRCLE NO. 283

TRANSISTOR MOUNTING KITS

... includes socket, templates, screws and washer

With these mounting kits, power transistors can be mounted electrically isolated from a chassis or heat sink while excellent heat transfer characteristics are maintained. Kits come in three types, differing in type of material for the insulating washer—teflon-coated glass cloth; mica, and anodized aluminum. Transistor socket is of laminated phenolic with phosphor bronze contacts. *Motorola, Inc., Semiconductor Products Div.*

. . . FOR MORE DETAILS, CIRCLE NO. 284

TWO-CIRCUIT PRECISION SWITCHES ... for machine tool limit and control mechanisms

The switches in this series have a median mechanical lift exceeding 10,000,000 operations at full overtravel. Three of the snap-action switches have a combined stacking width of only 2.03 in. Possibility of shorting is reduced by the step-design, arc-resistant plastic case that provides extra space between integral terminals. A minimum of .080 in.



overtravel is provided; contact arrangement is singlepole two-circuit, doublebreak. Micro Switch, a division of Minneapolis Regulator Co.

. . . FOR MORE DETAILS, CIRCLE NO. 285

LIGHT-WEIGHT, REINFORCED FABRIC DUCT

This new grade of highly impermeable flexible duct, available in sizes from ½ in. to 12-in. ID, is intended for installations requiring optimum air flow efficiency, can also be used for flow of liquids, gases, light solids and chemicals. Designed primarily for low-pressure venting in automotive applications, it's also recommended for uses wherever extreme temperatures are met or where high impermeability is desirable. The neoprene coated fiber glass fabric ducting does not support combustion, is very flame resistant. Flexible Tubing Corp.

. . . FOR MORE DETAILS, CIRCLE NO. 286

NEW HELIWELD AUTOMATIC UNITS . . . electronically controlled, for long run production uses

Of entirely new design, these units can be used for either a-c. or d-c. Heliwelding, without an accessory control, using argon, helium or mixtures of these shielding gases. They're specifically for long-run production applications on all ferrous and non-ferrous metals where good weld appearance is necessary or where stringent specifications must be met. The two models are identical, except that one has 3 and 12 in. offset bars to which the machine holder can be attached. Air Reduction Pacific Co.

. . . FOR MORE DETAILS, CIRCLE NO. 287



Manning Bros. Rock and Sand Co., keeps ahead of rigid delivery schedules with the new White 4200...

SUPER HAULER

for the West's Billion Dollar Construction Industry



You, too, will earn more with WHITE!

It takes a strong, efficient fleet of trucks to keep pace with the West's expanding economy.

Manning Brothers have learned this fact in 41 years of hauling rock and sand throughout Southern California. That's why Manning maintains an all-White fleet.

These White Super Haulers are not "standard", assembly-line trucks...indeed not! They're custom-engineered—built to do a specific job best!

Whatever your haul—sand, steel or the 1001 products made in the West's flourishing industrial empire—you'll find a White Super Hauler to help you do your hauling job better. Get the facts from your White representative now!

SUPER HAULERS STAY ON THE JOB with White Superservice!

Ask any White owner! He'll tell you that wherever your White works, there's dependable White service nearby to help you keep your trucks in top earning condition. Parts are readily available from the vast network of White dealers and from conveniently located parts warehouses. White service shops are the finest, most completely equipped anywhere. White keeps your trucks on the go!

Part of Manning's fleet of 25 Whites in service daily throughout Southern California,



WORLD LEADER IN HEAVY DUTY TRUCKS

THE WHITE MOTOR COMPANY

CLEVELAND 1, OHIO

Branches, distributors, dealers in all principal cities.



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WESTERN INDUSTRY/DECEMBER 1959



WESTERN NEWS

THE INDUSTRIAL WEST . . . ON IT'S WAY

PLANTS . PRODUCTION . DISTRIBUTION . PERSONNEL

St. Regis Paper Starts \$30,000,000 Expansion

TACOMA — A \$30,000,000 expansion program here, one of the largest for the Northwest in the last decade, plus a \$1,500,000 new plant in Los Angeles have been started by St. Regis Paper Co.

The project in Tacoma will add 150 employees and create a new \$750,000 payroll for this area. It includes a new kraft paper and paperboard machine with an initial capacity of 350 tons a day.

Ground breaking ceremonies in the Central Manufacturing District, Los Angeles, marked start of construction for a multiwall bag plant that will be double the size and capacity of the present facility. It is scheduled to go into production next spring, replacing the present plant. Ernest Landell and James Galasso will continue in managerial positions.

Convair Ground-breaking Begins \$7,500,000 Project

san Diego—Launching of a \$7,500,-000 industrial development took place recently when ground was broken for a 336,000-sq. ft. plant for Convair Astronautics Division of General Dynamics Corp.

The new facility is being built on a 28-acre site next to Convair's present plant on Highway 395. The building will consolidate a group of several Convair plants in the San Diego area. Missile and other astronautic parts for replacement purposes will be stored there.

American Marc Builds Boat Plant in Torrance

TORRANCE — American Marc. Co., manufacturer of lightweight diesel engines, is building a 50,000-sq. ft. plant on a 10-acre site at Manhattan Beach Blvd. and Inglewood Ave.

The new facility, representing a total investment of some \$600,000, will be used for production and sales of the firm's new glass boats. It will include a large pool, resembling a dock, in which smaller boat models can be displayed.

Giant Generator Assists at Hoffman Center Opening

EL MONTE, CALIF. — When Hoffman Electronics Corp. dedicated its \$2,-000,000 semiconductor center here recently, a starring role was played by "Big Bertha", world's largest solar energy converter. The giant generator, whose silicon solar cells convertight into electricity, powered a door-opening device for the 109,000-sq. ft. plant, first in the nation designed for mass production of solar cells.

The division's production capacity is more than doubled with the completion of the new center, which is engaged in advanced research and production of solid state materials devices.

Trane Co. Will Build Salt Lake City Plant

SALT LAKE CITY — An 86-acre tract at 10600 South St. will be the site of a \$1,000,000 facility for The Trane Co., LaCrosse, Wis., manufacturer of air conditioning equipment.

The 60,000-sq. ft. plant, plus warehouse facilities, will be basically a sheet metal operation. Commercial air conditioners, heating units, fans and ventilating equipment and heat transfer coils will be produced. According to D. C. Minard, Trane Co. president, the firm also expects "to do partial fabrication and final assembly of refrigeration compressors for big building air conditioning."

Steel Fabricators Start Facility in Sacramento

SACRAMENTO — Lewis - Riffel, Inc., Portland steel fabricating firm, has begun construction on a new plant on a 21-acre site on Elder Creek Road. The 27,000-sq. ft. facility represents an investment of about \$250,000 and will employ approximately 100 persons.

Steel Service Center Opens in Idaho Falls

IDAHO FALLS, IDAHO — Structural Steel & Forge Co. has opened its new steel service center on East Anderson St., with *Kent Johnson* as office and warehouse manage:

Hercules Powder Plans Big Western Expansion

HERCULES, CALIF. — A multimillion dollar Western expansion program announced by Hercules Powder Co., Wilmington, Del., will result in the first methanol production facilities in the West. The expansion project also calls for construction of new facilities for producing formaldehyde, ureaformaldehyde concentrates and slow nitrogen release urea-form.

The new facilities will make the Hercules plant here one of the most diversified chemical operations in the West, according to John M. Martin, general manager of the Explosives department, which will operate the plant.

Methanol is used principally in making formaldehyde, which in turn is used in the manufacture of resins for particle board and plywood adhesives.

Initial phase of the expansion is slated for completion in mid-1960, with other facilities scheduled to be ready early in 1961.

Spinning Mill Scheduled Next Year in Arizona

CASA GRANDE, ARIZ. — Plans for construction of spinning mill here next year was announced by Kimberly Mills, a new organization in the textile field

The facility will convert raw cotton into yarns suitable for use in weaving carpets and draperies, and for making rugs, mops and insulation.

The building will afford about 60,000 sq. ft. for manufacturing, plus a 15,000-sq. ft. warehouse area. Initial employment will be about 160 persons.

\$1,000,000 Aggregate Plant

SANTA ANA, CALIF. — Plans for construction of a \$1,000,000 plant for manufacturing lightweight aggregate were announced here recently. Susquehanna Corp. has leased over 1,100 acres of land for mining operations. Scheduled site of the plant will be northwest of San Clemente in Descheza Canyon.

Jorgensen Adds Plate Facilities at Two Centers

LOS ANGELES — Enlarged warehouse facilities for both Southern and Northern California are under construction by Earle M. Jorgensen Co., steel and aluminum distributor. Ground was broken recently for two additional warehouse bays, one here and one in Oakland.

The new bay here will bring total floor space for the service center to 393,000 sq. ft., while the Oakland construction means a 50% increase in area and a total of 207,000 sq. ft. for the Oakland and San Francisco facilities.

The new buildings will be primarily for storage and processing of steel plates, with stock including many specialty products. Modern high-capacity cutting equipment will be installed for sawing, shearing and flame cutting plates to any specified size or shape.

Two Western Monsanto Plants To Be Enlarged

SANTA CLARA, CALIF. — The Monsanto Chemical Co. plants here and in Long Beach are two of eight involved in expansion projects because the firm plans to increase production of styrene monomer by at least 20,000,000 lb. yearly.

All of the projects are for manufacture of new styrene-base — materials resulting from the company's research programs.

Welder's Supply Opens \$120,000 Seattle Center

SEATTLE—Welder's Supply Co., 4000 Seventh Ave. So., recently dedicated its \$120,000 service center, said to be the most modern in the Northwest. The firm distributes welding equipment and industrial gases to steel fabricating, shipbuilding, hospital, aircraft and lumber industries in this area.

Chamber of Commerce heads, company executives and representatives of Linde Co. attended dedication ceremonies.

Portland Firm Expands

PORTLAND—Precision Castparts Corp. will construct a \$100,000 addition to its facilities at 4600 SE Harney Drive. The 18,000-sq. ft. building will provide space for research and development, plus an area for increased production facilities.



P-I-E to Build Giant Freight Depot in Salt Lake City

OAKLAND — Pacific Intermountain Express is calling for bids from contractors for the construction of a new general freight terminal in Salt Lake City, Utah.

Plans call for a combination district office, terminal, and shop housing 275

employees, on a 12-acre site at 65 South Redwood Road. Completed construction calls for a 55x80 foot air conditioned office, an 80x123 foot shop, and an 80x310 foot dock with 54 doors.

These new terminal facilities are required to replace outgrown district operations. Construction is expected to get away next spring.

Black and Decker Expands Western Service Facilities

OAKLAND — A new factory service branch at 1107 E. 14th St., here and a new location for its Spokane, Wash., branch have been established by Black and Decker Mfg., Towson, Md., manufacturer of portable electric tools. The new Bay Area unit will supplement the San Francisco branch at 4343 Third St., offering tool repair and replacement parts for all Black and Decker products, including the Master Power air tool products of the firm's newest subsidiary.

Formerly located at 2706 Hemock St., the Spokane branch is now at 3025A E. Mission St. Roger Mortimer is service manager.

Gus Nelson is service manager at the Oakland branch, and Dan Morrison in San Francisco. Other Western branches are in Portland, Los Angeles, Phoenix, Denver and Salt Lake City.

White Motor Council

LOS ANGELES — White Motor Company's factory-distributor council of the Pacific Coast region held its semi-annual meeting in Los Angeles recently. Delegates represented all the firm's dealers and distributor states in the West, including Alaska and Hawaii.

New Plant in Placerville

PLACERVILLE, CALIF.—Start of construction was scheduled this month for a 40,000-sq. ft. plant for the Porter Muffler Mfg. Co. Site of the \$400,000 building, scheduled for completion in March, is a two-acre site west of here. The Porter firm is presently located at 11820 W. Olympic Blvd., Los Angeles.

Weston Hydraulics Opens \$1,000,000 Van Nuys Plant

VAN NUYS, CALIF. — Dedication ceremonies at a 33-acre tract here recently marked the opening of a 100,000-sq. ft. plant for Weston Hydraulics, Ltd., subsidiary of Borg-Warner Corp. The structure consolidates a number of previously scattered operations of the aircraft and missile components manufacturer.

Special installations include dustfree, temperature controlled rooms for missile producing and testing; a research building for testing units using high temperature fluids and gases, and explosion-proof test-observation chambers.

Roddis Plywood Expansion Will Double Production

ARCATA, CALIF. — A 50% increase in production during the next 18 months is scheduled at the Roddis Plywood Corp. plant which has embarked on a \$1,000,000 expansion program. Built in 1957 as a Western facility of a Marshfield, Wis., manufacturer, the Arcata plant has been in production on a 24-hr., 7-day schedule for the last year.

The plant produces Timblend wood shavings board used for plastic underlayment, sliding doors, cabinets and furniture. This year the firm introduced an exterior grade of the product, suitable for outdoor applications.

After the expansion program is completed, the plant will require 400 tons daily of prime fir wood as raw material.

Dow Chemical to Build NW Phenol Plant

SEATTLE — The Pacific Northwest has been selected as the site of a 36,000,000-lb. yearly phenol plant to be built by Dow Chemical Co. The Midland, Mich., firm has options on several sites in the area, including Puget Sound, Longview, Wash., and Portland, Ore.

Construction of the phenol plant is the first step in the long-range planned development of an integrated chemical and plastics manufacturing operation in the Northwest. Phenol is widely used as a chemical intermediate and is particularly important to the plastics, agricultural and lumber industries.

Several million dollars will be spent on property development and p'ant construction before operations start early in 1961.

H. K. Porter Acquires Hill Transformer Corp.

SAN CARLOS, CALIF.—H. K. Porter Co. has recently acquired its sixth manufacturing plant in the West, with the addition of Hill Transformer Corp., 1030 Washington St.

As a Porter operation, Hill Transformer will continue to make dry type and liquid immersed distribution transformers and power transformers for utility and industrial applications, supplementing products made by Porter's Delta-Star Electric division.

Max Hill, founder and president of the Hill firm, will continue as manager of the San Carlos operation.

Thiokol Chemical Will Add 1,000 Employees in Utah

BRIGHAM CITY, UTAH — Thiokol Chemical Corp. will add 1,000 new employes to its plant near here during the next year, to raise the total number of employes to 4,000, said Joseph W. Crosby, Bristol, Pa., president, on a visit to the plant recently. Thiokol has contracts for research in solid propellant rocket fuel and for the production and experimentation and research of the first stage of the Minuteman ICBM.

Tentative Solar Purchase

SAN DIEGO—Tentative plans to acquire Solar Aircraft Co. here were announced last month by International Harvester Co., Chicago.

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FOR INDUSTRY

DID YOU KNOW

that, the town of Luf-kin, Texas, besides being world famous for coon hunting, and cooking, southern style, is also the home of Lufkin Gears for Industry, Oil Field



Pumping V. J. Fawcott Units, and Heavy Duty Truck Trailers?

that, the town is nestled among the tall pine trees of East Texas, where forests thrive and grow five times faster than in other parts of the U.S.? Heavy rain fall and warm temperatures make it so.

that, the great southern paper industry utilizing southern pine, long leaf and loblolly pine, began in Lufkin, Texas-home of the Southland Paper Mills, back in 1937? E. L. Kurth, board chairman of Lufkin Foundry and Machine, is president of Southland, and to Mr. Kurth goes the credit for pioneering this vast industry from its infancy. Modestly, however, he would be the last to claim such recognition.

that, Lufkin Oil Field Pumping Units have earned worldwide red ognition for performance, depend-ability, and long life?

that, Lufkin Gears for Industry are fast gaining prominence in the fields of refining, pipelining, marine propulsion, aircraft ground support, and yes, even outer space?

But it's not all sweatin' and strainin' at Lufkin-the folks there are easy goin' and find time to go cat fishing, coon hunting, squirrel and crap shooting, and sometimes, go in for just plain loafing.



. . . for more details, circle No. 48

New Reynolds Aluminum Supply Building Opened



LOS ANGELES - A new Reynolds Aluminum Supply Company of California building has been opened at 6446 East Washington Blvd. in the Vail area of the Central Manufacturing District. The building which has 17,000 square feet of office building, also has another 100,000 square feet devoted to warehouse space, equipped with up-to-date and advanced facilities for handling and working aluminum, including equipment for shearing, slitting, corrugating, sawing and roll form-

In the lower photo, James Sargent, Western District Sales Manager, is



shown holding an aluminum billet. More than 6000 people visited the three day opening.

Clute Corp. to Expand Asbestos Plant at Napa

NAPA, CALIF.—An expansion that will increase production of the Asbestos Bonding Corp. from under 100 tons daily to 1,000 tons daily has been announced by the Clute Corp. of Littleton, Colo., which recently acquired the ABC property here.

ABC holds a 99-year fee lease on the largest known asbestos deposit in the country which has positive ore reserves established at 1,795,000 tons of short fiber asbestos and possible reserves of millions of tons more. Previously known reserves in the United States were about 1,000,000 tons located in Vermont.

At present Canada supplies about 95 per cent of the asbestos used in this country.

The ore is milled on the property in an air separation pilot plant designed for ABC by the Clute Manufacturing Division at Rocky Ford,

New Denver Branch

DENVER - A subsidiary branch of Keuffel & Esser Co. was established here recently for distribution of the engineering and drafting equipment and materials made by the Hoboken, N. J. firm. John Harvey has been appointed as branch manager.

Titan Chemicals, Inc. Organized in Seattle

SEATTLE-Titan Chemicals, Inc., is a new firm with offices and a warehouse in the Rudd Paint Bldg. at 1630 15th Ave. Formed to re-package and distribute fiberglass products to the laminated-plastics industry, the new corporation has been named distributor for Reichhold Chemicals, Inc., in the Northwest.

Procter & Gamble Begins Work on \$1,000,000 Project

SACRAMENTO-Procter & Gamble Mfg. Co. has started site preparation work for its \$1,000,000 expansion of facilities at Fruitridge and Power Inn Roads.

Scheduled for completion in 1961, the project's major unit will be a 40,-000 sq. ft. manufacturing and packaging building. Present employment of 250 is expected to increase by 100 with the expansion.

Long Beach Firm Expands

LONG BEACH, CALIF. - Kit Manufacturing, Inc., has announced its second expansion in 12 months with plans for a plant at McPherson, Kan. Last January the Long Beach mobilehome manufacturing firm started production at a new Caldwell, Ida., plant.

Vulcan Containers Plant Now in Ful! Production

SAN LEANDRO, CALIF. — Now in full production of steel shipping pails and tinplate cans is a new manufacturing facility established by Vulcan Containers Pacific Co. A 25,000-sq. ft. plant at 2424 Merced St., it includes a research and development facility.

Initially the plant is producing steel pails from 2½ through 6½ gallons and round tinplate cans in a variety of sizes from 1 through 25-lb. capacities. Future plans call for equipment to produce pails and cans of other sizes and types.

Vulcan Containers Pacific, affiliated with Vulcan Containers of Bellwood, Ill., will maintain warehouse facilities in Portland, Seattle and Los Angeles.

Publishers' Paper Co. Expands in Oregon

OREGON CITY, ORE.—Publishers' Paper Co. has revealed plans for a major expansion in its groundwood department.

The \$300,000 modernization program calls for a new building, replacing the present Mill H and the old sawmill structure to provide a modern plant for eight electric grinders.

Geometric-shaped plant for Pedersen Electronics

LAFAYETTE, CALIF. — An architectural shape as advanced as space-age electronics itself is that selected for the new plant of Pedersen Electronics, 3667A Mt. Diablo Blvd. Ground for the 10,000-sq. ft. building of a hyperbolic paraboloid design was broken recently and completion is scheduled for next March.

The new building, one of four such to be built, is on a 5½-acre tract near the firm's present quarters in northwest Lafayette. The new facility will house the firm's own machine shop, die making and painting area, plus sheet metal and metal finishing departments.

Wagner Bag of Salt Lake Purchased by St. Regis

SALT LAKE CITY — Wagner Bag Co. has become a division of St. Regis Paper Co., New York, and will operate as part of the newly-formed flexible packaging branch of St. Regis.

Management of Wagner will continue the same, with J. I. Wagner as president.

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Every link in ACME roller chains have uniformity, toughness and durability to withstand the ruggedness of lumbermill operations. They have, for years, been tested in every type of installation that calls for speed, stamina and smooth operation. They are engineered for years of tough, trouble-free service... to handle the heaviest load under the most arduous operating conditions. Be sure to get the most for your chain dollars by specifying ACME chain.

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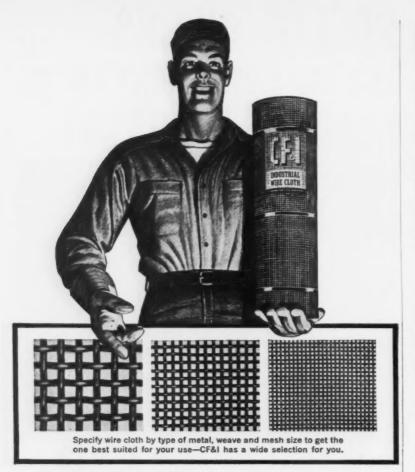


Write Dept. 2-U for new 100-page illustrated technical catalog including new engineering section showing 36 methods of chain adjustments.



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. . . for more details, circle No. 50 on Reader Service Postcard

Pacific Motor Plans \$500,000 Oreg. Terminal

PORTLAND — A new freight terminal, office and repair shop is planned by Pacific Motor Trucking Co., subsidiary of Southern Pacific, in the railroad's Brooklyn yards here. Construction is starting this year.

Facilities will include a 400-ft.-long terminal building, a 60 x 125-ft. repair and maintenance shop, office area and a truck service station. The project, costing about \$500,000, calls for rail spurs on both sides of the terminal, 36 truck loading bays and 18 rail car loading bays. The terminal will have an under-floor towveyor system.

\$14,000,000 Calaveras Plant Slated for Redding, Calif.

REDDING, CALIF. — A \$14,000,000 cement plant with an initial capacity of 1,500,000 bbls. annually will be built here by Calaveras Cement Co., a division of Flintkote Co. Location will be a raw material site encompassing over 1,500 acres of high-grade limestone and shale. Construction of the plant is to begin soon, with completion planned for March, 1961.

Beech Aircraft Unit Plans Facility in Boulder, Colo.

BOULDER, COLO. — Plans have been announced for a new administration and engineering building for the Beech Research and Development Corp., a wholly-owned subsidiary of Beech Aircraft Corp., Wichita, Kan., according to George W. Hostettler, manager of the division here.

The 13,000-sq. ft. structure will also house the manufacturing facilities now carried on at Longmont, Colo., and is to be built on the company's 1,460-acre site north of here.

C. Waldrop, manager of plant engineering at Wichita, will direct the building program. Completion target date is April 15, 1960.

Boeing Wind Tunnel Set To Start Operation Soon

SEATTLE—Scheduled to go into operation this month at Boeing Airplane's aerodynamic-research center is a new wind tunnel that will test models of future aircraft and missiles at satellite speeds and higher. Together with other tunnels it will provide Boeing with a testing capability in all speed ranges to Mach 27—27 times the speed of sound.





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Port of Portland Plans \$1,800,000 Project

PORTLAND - The Port of Portland Commission recently approved a \$1,-800,000 five-year plan for rebuilding Swan Island to provide sites for a multimillion dollar industrial devel-

Completion of the first of three phases, to cost about \$600,000, is scheduled by 1961. Plans include relocation of Channel Avenue, moving railroad tracks, razing several old buildings and possible extension of the harbor line on the channel side of the

A number of major industries have already made firm proposals to locate on the Swan Island and adjacent Mock Bottom sites, subject to redevelopment of the area

Chain Belt Acquisition

MILWAUKEE - A leading manufacturer of vibrating conveyors, Carrier Conveyor Corp., and its subsidiary, General Industries, both of Louisville, Ky., were merged recently into Chain Belt Co., whose products include power transmission machinery, material handling equipment, waste equipment and roller bearings. Chain Belt's plants include one in Los Angeles.

Cascades Plywood Plans Expansion of Montana Unit

POLSON, MONT.-An expansion-modernization program costing over \$1.-500,000 will be undertaken by Cascades Plywood Corp. at its recentlypurchased plywood plant here.

The Polson plant's output, princi-

pally of Larch plywood, has been secured by a commitment for 300,000,-000 ft. of timber in the vicinity, to be augmented by purchases of government timber.

Cascades Plywood recently contracted to provide United States Plywood Corp. with additional production, which within a few years will amount to 4,500,000 ft. per month. Most will come from the Polson plant.

Garrett Divisions Combine

LOS ANGELES - The Garrett Corp. has announced a merger of two divisions -Airsupply and Aero Engineeringinto a single unit called Airsupply-Aero Engineering Div. Headquarters will be in Beverly Hills, Calif., with Frank Miles, vice-president, as division manager.

Multi-plant conveyor conversion problem solved with



Gould-National makes full conversion in 90 days

Gould-National Batteries, Inc., makes batteries for hundreds of sales organizations, each having its own color combinations in trade marks and brand names, some requiring as many as three distinct shades. And Gould-National, to insure distribution of fresh batteries everywhere in the country, manufactures in 16 strategically located plants throughout the United States.

Battery manufacture is a highly standardized, mass-production operation. Economical application of painted multiple colors on the cases posed real problems in methods and equipment. The conversion at Gould-National required equipping 16 plants simultaneously with painting equipment and conveying systems coordinated with existing production lines.

Methods engineers at Gould-National made the multi-plant conversion in the record time of 90 days . . . using Standard Conveyor stock units, including Handidrive power unit, with big savings in cost. And what do these engineers say about Standard Conveyor? "Best possible method for our type of operation!"

Illustrated are scenes from the St. Paul plant of Gould-National. Line was designed to produce 3,000 multicolored batteries in 50 different sizes and colors per day.

When you have a materials-handling problem, call Standard - more than 50 years of conveyor engineering experience. Standard Conveyor Company, General Office: North St. Paul

9, Minnesota.





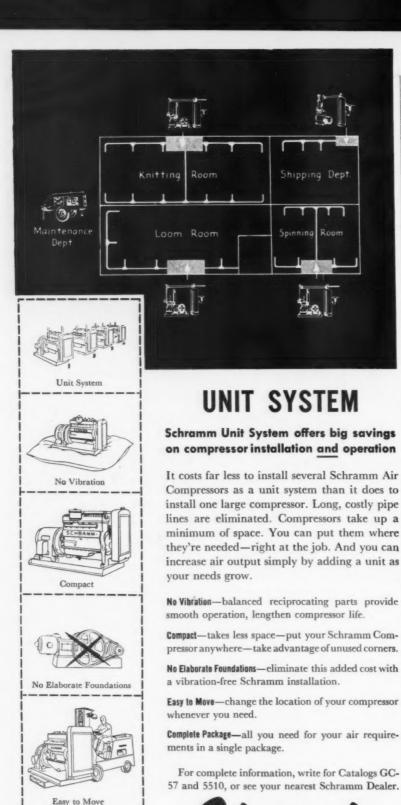
directory or write direct for Bulletin ddress Dept. H-12.

SEATTLE: Russel G. Daley, 502 First Ave. So. SAN FRANCISCO: 840 Harrison St.



PORTLAND: 1115 N.W. Gilson St. LOS ANGELES: 115 E. 23rd St.

. . . for more details, circle No. 51 on Reader Service Postcard



Western Gear Names Distributor in Arizona

PHOENIX — Semon Bearing and Supply Co., which has three branches in Arizona, has been appointed by Western Gear Corp., Industrial Products Div., as distributor of the company's StratLine gearmotors and reducers, including parallel shaft and vertical shaft units.

The distributor is located at 325 N. Third Ave., here; in Glendale at 133 S. Third Ave., and in Flagstaff at 16 Mike's Place, P. O. Box 1487.

More Aeronutronic Building

NEWPORT BEACH, CALIF. — Construction is scheduled to start next month on a 60,000-sq. ft. administration building, part of the \$22,000,000 engineering and research center being built by Aeronutronic, a division of Ford Motor Co. Construction has also been started on a 50,000-sq. ft. central services building and a 30,000-sq. ft. environmental test building.

\$6,000,000 Safeway Facility in Sacramento

SACRAMENTO — A \$6,000,000 distribution center that will include 442,500 sq. ft. of space under one roof will be built here by Safeway Stores, Inc.

Scheduled to be erected early in 1960, the center will be located on Florin-Perkins road, just north of Fruitridge Road.

According to G. R. Stafford, Safeway's Sacramento division manager, the facility will include a bakery, fruit and vegetable pre-packing plant, egg grading and packing section, and facilities for box and crate repair and truck maintenance.

About 400 new employees are expected to be added for the operation.

New PG&E Facilities Go Into Operation

san Jose, Calif. — Another project in the continuing expansion program for Pacific Gas & Electric Co. is scheduled to go into operation early this month as new transmission and substation facilities supply additional power for this area.

The \$2,592,000 facilities include a new \$1,687,000 substation near Cupertino, first in the PG&E system with both all aluminum wiring and welded aluminum bus bars.

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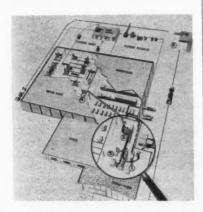
Factory Branch—Los Angeles
Sales, Rental, Service and Parts—846 E. 6th St.,
Los Angeles 21, Calif., MAdison 3-4177

Branch Office - Oakland. Pacific Building, 16th & Jefferson Sts., Oakland 12, Calif. HIgate 4-3982

Complete Package

Conveyor System Feature of New Braun Facility

PICO RIVERA, CALIF. — A feature of the new plant under construction by Robert H. Braun Co. is a conveyor system that will expedite parts service through the 32,000-sq. ft. facility. Said to be the largest material handling facility in the West, and one of the largest in the nation, the plant is scheduled for occupancy about Jan. 1, according to Don Ferguson, vice president.



Key to the drawing shown here is: 1—Will call counter, where direct orders are taken, checked and inserted in the belt conveyor;

2—Phone order desks, also on belt conveyor line;

3—Inventory control, where the order is picked up from the conveyor, checked, recorded and given to the stock warehouse personnel who send part to shipping or place it on the tote box conveyor for return to will-call;

4—Repair shop tool and parts office, where orders for shop parts are inserted in the twisted belt conveyor traveling overhead direct to inventory control for processing;

5—Loading dock, where rebuilt and incoming equipment to be repaired is delivered for outgoing delivery or pick-up by shop. A loading ramp built into the shipping platform saves loading time.

Photocircuits Begins Building Anaheim Plant

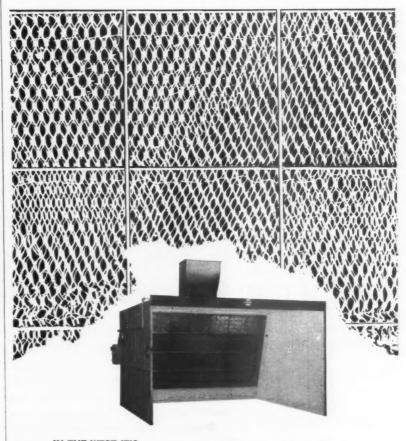
ANAHEIM, CALIF.—Photocircuits Corp. of California broke ground recently for a plant in the Southeast Anaheim industrial district.

Civic and company officials took part in the ceremony at the plant site, a 15-acre tract on Howell Avenue east of Placentia Ave. The facility will supply printed circuits to the electronics and aircraft industries.

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... for more details, circle No. 53 on Reader Service Postcard

Firm Purchases New West Coast Plant



LOS ANGELES—Lyon Metal Products, Inc. of Aurora, Illinois, announces the purchase of a manufacturing plant on the West Coast. The plant, only two years old, covers 160,000 square feet, with more than 16 acres of land for expansion. It is located 18 miles from downtown Los Angeles.

According to the Company this action was taken to protect their Western market by improving their transportation costs, to better service their Western dealers and customers.

Prior to the purchase of this new

plant, Lyon contracted with the Stanford Research Institute to make a study of Lyon Western markets and to recommend the best location, taking into consideration present markets, distribution, future growth, type of required labor, etc. The Stanford Research Institute report, which required four months of study, recommended the area where this new plant is located.

The Los Angeles district sales staff and warehouse operation will move immediately into the new offices.

Rucker Co. Expands

SEATTLE—As part of its current expansion program, The Rucker Co. of Oakland moved its Seattle facilities to 1705 Fourth Ave. S. Warehousing space has been doubled and service and repair departments enlarged.

Clem Niven is Seattle manager and Walter Zoul, recently transferred from Los Angeles, is on the sales staff.

A stocking distributor of hydraulic and pneumatic components and replacement parts, Rucker is also a manufacturer of fluid power systems and related products.

Hollywood Plastics Moves To New Los Angeles Site

Los ANGELES — Hollywood Plastics, Inc., moved recently to a new plant at 4560 Worth St., a 35,000-sq. ft. building with manufacturing, warehousing and office areas.

Only eight years old, the firm is said to be the world's largest manufacturer of U. S. Royalite industrial and school trays and boxes. Other products are industrial parts boxes, food-handling boxes and meat lugs, specialized display fixtures and constituent parts.





E. ROY DAHLSON (right), General Manager of Coberly-West Company, Bakersfield, says: "Cotton ginning is a 'shirtsleeves' kind of business. That's why we like the 'shirtsleeves' approach of Industrial Indemnity's safety engineers. They actually get out into our eleven gins and help us prevent accidents which could have sent our workmen's compensation costs skyrocketing. In addition, the services they perform are humanitarian, and they help keep the morale and efficiency of our 400 employees at peak operating levels. Thanks to the recommendations of our insurance agent, Walter Lindecker (left), of the Walter Mortensen Agency, we've enjoyed the benefits of Industrial's quality service for years."

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First Western Production Facility for Lightolier

LOS ANGELES — First Western ware-housing and producing facilities for Lightolier, Inc., of New Jersey will be opened here in January. The firm is presently completing a \$500,000 structure at 2515 S. Broadway that will serve as Western headquarters, showroom, warehouse and custom factory.

Part of the 21,000-sq. ft. factory will be used for manufacturing operations of the Dorner Custom division of Lightolier, which serves industrial, commercial and other lighting fields.

Research Unit, New Plant for Stauffer in Bay Area

RICHMOND, CALIF.—Construction is slated to start next month on the first \$1,600,000 unit of a major research center for Stauffer Chemical Co. Site of the next project is a 10-acre tract adjacent to the chemical firm's present plant and laboratories here.

Plans for the research unit call for 20 laboratories for basic and applications research, library and auditorium, units for bench-scale process development and service facilities.

Another Stauffer project under way here is a new plant that will double its capacity to produce agricultural chemicals for Northern California. The new plant, slated to be in operation by February, will replace Staufer's present agricultural chemicals unit at Berkeley. It will produce a broad range of both dry and liquid chemicals.

Denver Resins Branch

DENVER, COLO. — Archer-Daniels-Midland Co. of Minneapolis has opened a new resins and commodity oils sales branch at 234 Commonwealth Building. The unit will serve the protective coatings industry in Colorado, Utah, Wyoming, Montana, New Mexico and the El Paso, Tex., area.

Thermo-electric Research Center for Albuquerque

ALBUQUERQUE — David Karr, president of Fairbanks Whitney Co., has announced his firm will open a research center here in February. Primary objective will be the development of thermo-electrical power . . . "the conversion of cheap fuels into electrical power with the minimum of working parts."



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Simpson Plans \$1,000,000 Sawmill in Shelton, Wash.

SHELTON, WASH.—A \$1,000,000 sawmill will be built here next year by The Simpson Logging Co., as part of an expansion program that includes development of 15 acres of waterfront industrial sites and enlarging the firm's cargo-shipping facilities.

According to *H. W. McClary*, vice president and general manager, the small-log sawmill will have the industry's latest equipment for handling timber six to 22 in. in diameter. Daily capacity of the new plant will be 120,000 bd. ft. in an eight-hour shift, increasing the firm's production here to over 720,000 bd. ft. daily.

A new loading dock and an outdoor chip-storage bin are also scheduled.

Leach Buys Pendar Unit

COMPTON, CALIF. — Leach Corp., producer of components and systems for air and space, has purchased the electronics division of Pendar, Inc., Van Nuys, Calif., manufacturer of static switching, timing and annunciating devices. Leach, which is celebrating its 40th anniversary this year, will integrate the Pendar unit with its relay division.

Bay Area Metal Finishing Firm Changes Hands

BERKELEY — Hardco of California, Inc., metal finishers, has been acquired recently by William J. Saunders, Los Angeles industrialist.

Hardco has two facilities in the Bay Area, one at 1235 Fifth St., here, which provides architectural metal finishing services. The second, at 1015 Terminal Way in San Carlos, undertakes metal finishing for both defense and commercial work.

Diversification and expansion of facilities is now underway, Saunders said.

Proposed Arizona Plant To Have Payroll of 300

FLAGSTAFF, ARIZ. — Plans for a pulp paper plant that will employ some 300 persons have been announced by *Orrin C. Compton*, attorney. The proposed facility will be located southeast of here on the site of the now defunct Arizona Pulp & Paper Co.

According to Compton, the plant will be operated by a major pulp manufacturing firm. Negotiations for acquiring the property are now under way.

Hills-McCanna Changes Bay Area Office Location

SAN LEANDRO, CALIF.—Hills-McCanna Co., Chicago, has announced relocation of its San Francisco district office to 211 Joaquin Ave., here. E. H. Lund is district manager and G. F. Dunn, sales engineer, for the unit, which serves Northern California and Nevada.

Hills-McCanna products include ball and diaphragm valves, chemical metering and proportioning pumps and light alloy castings.

Ringsby Truck Lines Opens Import-Export Service

LOS ANGELES — Ringsby Truck Lines has announced opening of an importexport department that will provide complete, specialized carrier service for firms involved in foreign trade.

A fleet of more than 40 truck-trailers to service freight promptly in the Los Angeles-Long Beach harbors, warehouses and airports is a part of the new service offered by the Denver-based motor freight carrier firm. Ringsby is pickup agent for two freight forwarding companies, United Freight, Inc., and Inter State Express, Inc., both of Los Angeles.

4 Albuquerque Firms Join Forces; Win AF Contract

ALBUQUERQUE, N. M. — Four firms incorporated here under the Small Business Administration have won a \$1,250,000 Air Force contract to write and print secret Air Force manuals on operation of aircraft and special weapons systems.

The local companies are Applied Research Associates, Inc., Bandelier Films, Inc., Machine Engineering Corp., and Ward Anderson Printing Co.

Triplex Builds New Smelter in Colorado

PUEBLO, COLO. — The new \$67,000 all-metal smelter building at the Memorial Airport piston plant of Triplex Division of Aluminum Industries is scheduled for completion soon.

Construction did not stop smelting of aluminum alloy ingots. Furnaces still operated while workmen tore down the walls and roof of the wooden building housing the facility. The change is being made as a safety factor since several fires have occurred within the old building this year.

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Plant Expansion Completed by Aeroquip



BURBANK, CALIF.—The Western Division of Aeroquip Corporation has completed a 29,500 square foot expansion in Burbank, California. This brings the division's total plant area to more than 80,000 square feet. The new expansion provides additional space for housing both machine and office areas and is another major phase in the growth of the Western

Division and a part of a \$2,400,000 expansion program now being carried out by Aeroquip Corporation. The company has two other plants in the Los Angeles area: the General Logistics Division in Burbank and the Marman Division in Los Angeles General headquarters of the Aeroquip Corporation is in Jackson, Michigan.

Granberg Corp. Purchased

OAKLAND, CALIF. — The Granberg Corp., manufacturer of tank truck, bulk plant and pipeline petroleum meters and pumps, was acquired recently by American Meter Co., Philadelphia. Manufacturing and other operations will continue at the plant, 1308 67th St., and the firm will expand its engineering and development program begun recently.

NW Expansion Considered

ABERDEEN, WASH.—Construction of a \$1,300,000 plant here is under consideration by Aberdeen Plywood & Veneers, Inc. The facility, to employ about 50 men, would be a flake-and-particle-board plant.

Portland Firm Purchase

SEATTLE—Purchase of the Blue Bell Potato Chip Co., Portland, by Sunshine Biscuits, Inc., New York, was announced recently.

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Two Utah Natural Gas Distribution Firms Merge

SALT LAKE CITY — Two southern Utah natural gas distribution firms have merged and will be known as Natural Gas Company of Southern Utah, with executive office at 445 East 2nd South here.

The merging firms are Citizens Consolidated Natural Gas Co., headed by P. L. Jones, Nephi, and Peoples Consolidated Natural Gas Co., headed by Charles R. Hunter.

The firm is seeking a certificate from the Utah Public Service Commission to distribute natural gas in Sanpete, Sevier, Juab, Millard, Beaver, Iron and Washington counties, according to Milton Allen, executive vice-president.

Asbestos Mill Scheduled To Be Built Near Stockton

STOCKTON—Plans for building an asbestos mill with a capacity of 2,000 tons of ore daily have been announced by Jefferson-Lake Sulphur Co. of Houston, Tex. Total investment in the plant and 480 acres in Calaveras County will be about \$9,000,000.

The land, which holds a major deposit of chrysotile asbestos, was purchased from American Asbestos Co. of New York.

Construction is scheduled to start early next year, with completion planned for early 1961. Employment will be approximately 175.

Engineering Rep

BEVERLY HILLS, CALIF. — The Airsupply Engineering Division of Garrett Corp. has undertaken product engineering and sales representation for the Sigma Electronics Research Corp., which is engaged in the fields of microwave and infrared, serving industry, the military, and education.

Hawaiian Freightways Unveils House Flag

HONOLULU — Hawaiian Marine Freightways, Inc., a member of Consolidated Freightways transportation system, unveiled its new house flag recently.

The new bright green standard has a draped shield of gold surmounted by a crown, with a red block letter "H" in the shield's center. Each corner of the green field has a gold star.

Mrs. John A. Barthrop, wife of the company president, officiated at the unveiling of the flag aboard the SS Lanakila.

Ekco Plans To Acquire Washington Steel Products

TACOMA — Acquisition of Washington Steel Products Co., 1940 E. Eleventh St., manufacturer of builders' hardware, by Ekco Products of Chicago is under discussion.

Ekco is engaged in the builders' hardware field through its subsidiary, the Kennatrack Corp. of Elkhart, Ind., and plans further expansion in that field. Washington Steel has subsidiary companies in the wholesale hardware distribution field in the Northwest.

Cornell Industries Moves To Milwaukie Park Site

PORTLAND — A new facility at 2323 S. E. Harvester Drive in Milwaukie Industrial Park was occupied recently by Warren Industries, which include Cornell Manufacturing Co., Pump Pipe & Power Co. and Water Engineering Consultants.

Some 20,000 sq. ft. of shop and warehouse space, plus an office area, are provided in the building for the three firms which provide an integrated operation.



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Crown Zellerbach Expands Mill at West Linn, Ore.

PORTLAND — A \$4,500,000 program that will improve product quality and plant efficiency has been announced for Crown Zellerbach Corporation's West Linn Division, Oregon's largest pulp and paper producer.

The firm will install blade coating equipment on the plant's two publication grade paper machines so that double-coated magazines and printing papers for four-color high speed presses can be produced. In the groundwood mill, special screens are being installed to improve pulp quality.

Other installations scheduled during the program, already underway, include a 100-ton per day bleaching unit; a refiner unit to make ground-wood pulp from chips, and centrifugal cleaning unit. Facilities to unload and store chips made from left-overs are near completion on a two-acre site adjoining the mill's filtering plant.

The West Linn operation, which has 10 paper machines, provides year round employment for 1,400 persons, with an annual payroll of over \$7,300,000.

Slivatek Distributors

TACOMA, WASH. — Among five new panel products distributors for Silvatek Division of Weyerhaeuser Co. are Neiman-Reed Lumber Co., Inc., Van Nuys, Calif., and Goldenberg Plywood & Lumber Co., Inc., of Los Angeles.

Parker Seal Opens Lab in Culver City

CULVER CITY, CALIF.—A research laboratory devoted exclusively to specialized seals and sealing problems in aircraft, missiles and industry was opened here recently by Parker Seal Co. The new lab is housed in a 20,000-sq. ft. building adjacent to the firm's main building at 10567 Jefferson Blvd.

Swanton Firm To Handle Triangle Mfg. Co. Bearings

LOS ANGELES — Harold R. Swanton, Inc., headquartered here, has been named a direct factory representative for pillow block bearings and bearing mountings made by Triangle Manufacturing Co., Oshkosh, Wis.

Swanton also has sales offices and warehouses here, in San Francisco and in Seattle. The representative will serve 11 Western states.

Hydro-Aire Purchases Newark, N. J., Firm

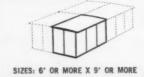
BURBANK—Hydro-Aire Co., a division of Crane Co., has broadened its product line with the purchase of Lyndon Aircraft, Newark, N. J., manufacturer of magnetic flutter dampeners and actuators for the aircraft missile industry.

Lyndon's products will be assimilated by the end of this year into the manufacturing operation of Hydro-Aire, producer of anti-skid braking systems, controls, actuation systems and electronic devices.



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WESTERN INDUSTRY/DECEMBER 1959

Horkey-Moore Adds To Torrance Facilities

TORRANCE, CALIF.—Horkey-Moore Associates has completed a new manufacturing and engineering building, the fourth to be occupied by the firm since its inception in 1957. The 13,500-sq. ft. addition brings total floor area to 33,000 sq. ft., for design and production of projects for the aircraft, missile and electronic industries.

Fabricated Steel Installs Bridge Crane at Ziegler's

LOS ANGELES—A 7½-ton, 60-ft. bridge crane, made by Fabricated Steel Service, Inc., was installed recently at the Ziegler Steel Service Corp. warehouse at 7022 Bandini Blvd.

Similar to several other installations made by the North Hollywood fabricating firm in the last four years, the bridge was fabricated from wide flange beams welded together to form a unique box beam section with torsional strength produced by steel plate diaphragms. The craneway was also built by Fabricated Steel, 7400 Laurel Canyon Blvd.

Wyoming Uranium Mill Starts Up in Record Time

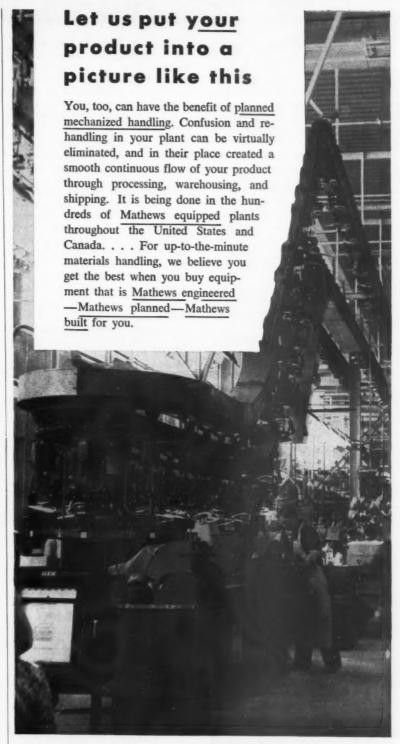
RIVERTON, WYO.—Just six months after start of construction, the uranium mill 50 miles east of here has begun producing uranium concentrates. The mill is owned by Federal Uranium Corp. and Radorock Resources, Inc., both of Salt Lake City, and the Gas Hills Uranium Co., headquartered in Laramie, Wyo.

Total cost of both mining and milling operations exceeds \$6,000,000. The facility has a minimum rated capacity of 522 tons of uranium ore daily. Approximately 100 workers will be employed in mining and milling.

Steel Research Lab Scheduled in Provo, Utah

PROVO, UTAH — A materials research laboratory—one of the most advanced in the steel laboratory—will be built by U.S. Steel's Columbia Geneva Steel Division at its Geneva Works near here. Scheduled for completion early in 1961, the research center will conduct intensive studies on Western-produced iron ore, coal and coke and other raw materials used in steel-making.

A feature of the two-story building will be a high-bay rear portion with an area equipped with adjustable multi-level supports to facilitate combining individual processing units into continuous testing systems.





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Contract News in the West

SEATTLE—Boeing Airplane Co. in the Northwest and Douglas Aircraft in Southern California share the contract spotlight with recent orders in the multi-million dollar class. Boeing has been given the prime contract and major responsibility for development of the Air Force Dyna Soar boost-glide manned satellite.

The contract covers building the vehicle portion, integration of vehicle subsystems, integration of vehicles, assembly and testing. The Martin Co. of Baltimore will build the Booster portion of the weapon system. About \$35,000,000 will be spent on the project in fiscal 1960.

The Douglas contract is from Canadian Pacific Airlines for four 159-passenger DC-8 jet airliners, involving an expenditure of \$6,000,000 per plane. A total of 150 DC-8's are now either delivered or on order from Douglas.

Boeing also recently awarded a subcontract, one of three totalling \$2,-300,000, to the Pacific Division of Bendix Aviation Corp. for R and D work on the Minuteman intercontinental ballistic missile weapon.

Westinghouse Electric Corp. reports an additional \$5,250,000 order from

the Navy for work on launching systems equipping four nuclear-powered submarines to fire the missile Polais. According to *James S. Hagan*, manager of the Sunnyvale, Calif., Westinghouse manufacturing division, this brings total Polaris contracts to \$45,000,000.

Over \$3,000,000 in army ordnance contracts, about equally divided between the San Francisco and the Los Angeles districts were announced recently. Principal Southern firms that received orders include North American Aviation, Douglas, Engineered Magnetics, Redsel Engineering Corp., Harvey Aluminum, Firestone Tire & Rubber, Radioplane Co., California Computer Products, Hughes Aircraft, Western Gear Corp., Gilfillan Brothers and Motorola Inc., of Scottsdale, Ariz.

In the Bay Area nine small business firms were among the 23 companies and research centers who shared in \$1,500,000 in new defense business. These include Food Machinery and Chemical Corp., Aerojet-General, Pacific Tire & Rubber Co., Ampex, Engineers, Ltd., Ball Bearing Co., Dalmo Victor, Laher Spring and Tire Corp.

Among other contract news re-

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Corrosion

ported to Western Industry recently were orders to:

Librascope, Inc., \$1,800,000 for guidance computers for the Centaur space probe missile, awarded by Minneapolis-Honeywell, who will develop the inertial guidance system for Convair, prime Centaur contractor;

The Siegler Corporation's Hallamore Electronics division—one for \$900,000 for Convair's missile and space programs and the other, for a follow-on \$700,000 contract from Sperry Utah Engineering Laboratory for test equipment on the Sergeant;

Acoustics Associates, Inc., orders from Convair Astronautics for a substantial quantity of ultrasonic liquid level sensors used in monitoring loading of liquid propellants in the Atlas missile;

Packard Bell Electronics, \$300,000, for radar tests sets; Electronic Engineering, \$207,000 for radar data handling equipment; Datalab Div., Consolidated Electrodynamics, \$200,000 Philoo contract for magnetic-tape recorder/reproducers for the Project Courier; and Astoria Marine Construction Co., a \$459,719 contract for reactivation of three LSM landing ships for transfer to allied governments.



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WESTERN INDUSTRY/DECEMBER 1959

Rheem Acquires Interest in Califone Corp.

LOS ANGELES — Rheem Manufacturing Co., New York, has acquired a majority interest in Califone Corp., 1020 N. LaBrea Ave., a leading manufacturer of teaching devices. Renamed Rheem Califone Corp., the firm will operate as a subsidiary in connection with Rheem's recently announced line of teaching machines for school and industry.

Rheem, which makes containers, electronic equipment, machinery and diverse other products, has 16 U.S. plants, seven of them in California.

IBM Breaks Ground for Bay Area Card Plant

campbell, calif.—Ground breaking ceremonies were held recently for a new 70,000-sq. ft. card plant for International Business Machines Corp.

The new facility is located on a 20acre site at E. Parr Avenue just off Winchester Road.

Beryllium Produced from Domestic Ore in Colorado

DENVER — The Mineral Concentrates & Chemical Co. here has announced the nation's first commercial production of beryllium oxide from domestic ores at its new plants in Loveland and Berthoud, Colo.

The firm has an exclusive contract with U. S. Beryllium Co. for all production of beryllium ore from its Boomer mine in Park County, Wyo.

A high temperature furnace designed by Pacific Foundry Co. has been installed at the firm's Loveland plant and has turned out material assaying 99.99% pure, according to R. S. Myre, executive vice-president and general manager of the company.

The new Colorado-developed chemical extraction process can handle low grade ore, which predominates in the United States. Previously the nation was entirely dependent on high grade beryllium imported from Africa. South America and India.

Westinghouse Distributor

FRESNO—Westinghouse Electric Corp. has named Snider Electric Service & Supply Co. as an industrial apparatus distributor. E. J. Franz heads the Snider firm, which has new facilities at 4651 E. Date St.

LA Industry Growth Tops 1958 Figures

\$3,000,000 in industrial expansions and operations in Los Angeles county was reported for October this year as compared with October, 1958.

The total figure for the month was \$14,908,000, with \$2,130,000 for new firms and \$12,778,000 for expansions of established facilities.

Total for this year's first ten months is \$127,252,625.

Sylvania Dedicates New Wing for Laboratories

MOUNTAIN VIEW, CALIF. — Dedication ceremonies were held here recently for a 76,000-sq. ft. addition to Sylvania's electronic defense laboratory. The two-story wing brings the laboratories' total space to some 140,000 sq. ft., where about 650 persons are employed.

Dow Buys Bay Area Firm

san carlos, calif. — Sequoia Metalcraft Co. Inc. was purchased recently by Dow Chemical Co., Midland. Mich., which will operate it as a wholly-owned subsidiary. The magnesium foundry firm employs about 50 persons.

Sel-Rex Corp. Establishes Branch in Santa Monica

santa Monica, Calif. — A Western branch for Sel-Rex Corporation of Nutley, N. J., was established recently at 2180 Colorado Ave. The new unit provides expanded facilities for more personnel and warehousing of precious metals processes and equipment.

Walter H. Walczyk, West Coast representative for Sel-Rex, heads the activities in this area.

Anachrome Corp. Opens Facility in Tucson

TUCSON — Anachrome Corp., South Gate, Calif., recently opened its Arizona Division, geared to produce hard anodizing for the electronic and missile industries in this area. The production program will emphasize creation of hard anodized coatings on aluminum parts where dielectric strength and thermalconductance are required.

Anachrome Corp. is an affiliate of Anadite, Inc., large metal finishing and chemical milling firm specializing in protective and decorative metal finishes. depend on

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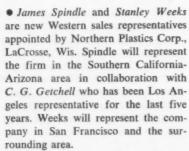


More than 4000 Models





westerners at work



- Joseph B. Strahan has been selected as district sales manager in the Los Angeles-Bakersfield area for Dayton Industrial Products Co., a division of the Dayton Rubber Co. Formerly with Aircraft & Industrial Bearing Inc., Culver City, Calif., Strahan will handle the Dayton firm's line of industrial V and cog belts, hose and related equipment to industrial wholesale and distributor accounts in Southern California.
- Halle P. Robb has been named manager of sales for all products of Electric Steel Foundry Co. in northern California, Nevada and Utah. He will also continue as manager of Pacific area sales for the Portland firm's international division. Another appointment is that of W. R. Rice as manager of sales of mill products. Don Erickson is office manager for ESCO-San Francisco and Karl Moore is sales representative.
- Charles E. Wadden, manager of sales, and A. J. Rado, chief engineer,



M. C. Isheim Standard Steel



H. P. Robb ESCO



A. R. Keyes Stanley



J. B. Strahan Dayton Rubber



A. J. Rado California Steel and Tube



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K. Martin Sparton



C. E. Walden California Steel and Tube

have recently joined the staff of California Steel and Tube in Los Angeles. Walden was formerly with Rome Cable Corp. and Rado for the last several years has been president of his own firm, A. J. Rado and Associates.

- Kenneth E. Martin has joined Sparton Corporation as Western regional sales manager for its new railway equipment division, directing the marketing effort of these products in all Western states from regional head-quarters in San Francisco. Martin has previously been with Houston Pipe & Steel, Inc., and The Flori Pipe Co., both former Sparton subsidiaries.
- Maynard C. Isheim has been selected as manager of Standard Steel Corporation's process equipment division in Los Angeles, after being assistant chief engineer of the division since joining the firm last May. Previously Isheim was affiliated for 12 years with C. O. Bartlett & Snow Co., Cleveland.
- Edmund E. Farrell has joined Motorola's Semiconductor Products Division as district sales manager in the Western region sales area, supervising sales in the south central area of California. Farrell's background includes more than three years experience in sales and applications of all types of semiconductor devices, including germanium and silicon rectifiers and transistors. He will headquarter at Mo-

torola's Western office, 1741 Ivar Ave., Hollywood.

- Arthur R. Keyes has been selected as central and northern California sales representative for Stanley Steel Strapping, division of The Stanley Works, New Britain, Conn. He was previously in Chicago representing the National Cash Register Co. for five years.
- Harry L. Simon, chairman of the Board for Foucar, Ray & Simon, Inc., died Nov. 11 in San Francisco. Considered the dean of steel warehousemen on the West Coast, he founded the firm in 1907 and was its president until a few years ago. S. H. Diehl, president, will succeed him as chairman of the board.
- E. L. Phillips has been named to the newly created position of regional manager—West Coast operations—for the Stainless and Strip Division of Jones and Laughlin Steel Corp. He will direct all Western activities of the division, including the Los Angeles district sales office, mill and service center. John E. Cottier will assume responsibility for all mill sales of the division and John H. Sutton will serve as assistant district sales manager.
- James A. Gregg has been named by Swedlow Inc., Los Angeles, to head a new sales engineering office in Arlington, Tex., that will serve a five-state area including New Mexico and Colorado.

- Martin M. McGuire has been elected vice president and plant manager of Screw Conveyor Pacific Corp. in Santa Clara, Calif. He joined Screw Conveyor Corp. of Hammond, Ind., in 1955, and in 1956 was transferred to the plant of its Western subsidiary.
- Lowell E. Hunt has been assigned by Standard Oil Co. of California to Seattle where he succeeds S. E. Stretton, retired, as regional manager. Hunt's position as assistant general sales manager, wholesale, in San Francisco was filled by A. E. Stevens, who leaves his post as manager of the company's motor fuels division. Stevens will be succeeded by C. G. Wood, Fresno regional manager; W. R. Carter, assistant regional manager in Portland will replace Wood in Fresno and A. B. Woodside will take over Carter's duties. Woodside, assistant regional manager in Phoenix, will be succeeded by Howard P. Hetzner.
- T. M. Cromwell has been named process superintendent in the production department at the United States Borax & Chemical Corp. refinery in Boron, Calif. Formerly manager of the chemical engineering department, he is succeeded in that position by D. L. Sawyer, previously a section head at the facility.
- Lewis M. Bound, Jr., has been named by General Controls Co. as Northern California sales representative for Tork-Master and Foster Engineering Division products. Bound is located in the firm's San Francisco factory branch office at 600 Bryant St.
- W. G. Ballantyne has been appointed special products sales representative for the industrial division of the George M. Philpott Co. of Portland, distributor of anti-friction bearings, pillow blocks, V-belts, motors and other power transmission equipment.
- John E. Schmitz has joined the recently formed chemical division of Electronic Production & Development Inc., as general manager and chief engineer. A former research engineer with North American's Autonetics Division, Schmitz will supervise production, new product development and other operations of the Hawthorne, Calif., division.
- William I. Ballentine, Jr., has been appointed chief engineer for the Southern Pipe Division of U. S. Industries, Inc., Azusa, Calif., with re-

- sponsibility for research and development, inspection and engineering functions.
- George E. Keck was elected vicepresident, maintenance, for United Air Lines, succeeding William P. Hoare who retired recently after 32 years with United. Percy A. Wood has been promoted from staff assistant in the engineering department to Keck's former position as assistant vice president, engineering and maintenance. Keck reports to J. A. Herlihy, senior vice president, engineering and maintenance, at the company's maintenance base in San Francisco.
- Irving Foss of Glendale, Calif., has been named a manufacturer's representative for beaded chain and small swaged parts made by Auto-Swage products of Shelton, Conn. Foss will cover California, Arizona, Oregon, Washington, Utah, Colorado, Nevada and New Mexico.
- David W. Berkey has joined the sales staff of Hercules Equipment & Rubber Co., Inc. of San Francisco, leading Northern California distributor for B. F. Goodrich industrial products. Berkey will also be associated with Hercules' two manufacturing affiliates, The Gasket Shop, Inc., and The Standard Rubber Co.
- A. H. Clement and E. N. Gray have been promoted to key positions at General Electric's Western regional electronic receiving tube facility in Los Angeles. Clement has been named manager of the regional warehouse and Gray named his successor as supervisor of commercial service.
- David Ury has been named manager of production planning at Enterprise Div., General Metals Corp., in San Francisco. Ury has been in the diesel engine business since 1929 and before joining Enterprise was with White Diesel Motor in Oakland.
- Jack Murnane has succeeded D. W. DeLano as San Francisco district manager for Pioneer-Division of Flintkote Co. Other key appointments in that district are William C. Thieleman to assistant district manager in charge of the roof engineering department and Fred Fox to roofing supervisor of the district.
- Eugene H. Swett has been named superintendent of the rolling mills and mills-finishing and shipping depart-

- ments at the South San Francisco plant of Bethlehem Steel Col., Pacific Coast Division. Formerly assistant to the superintendent of the rolling mills, Swett has been with Bethlehem since 1951. The division has also announced retirement of J. R. Myles, who has been superintendent of the mills and mills-finishing & shipping departments. Myles has been in the steel business since 1912 and for 34 years was superintendent of the mills department.
- Austin Van Houten has been selected as manager of production and material control for the Hughes Aircraft Company's ground systems group. He has been with Hughes since 1952 and formerly was with the FBI. Another appointment for the group was that of John C. Morey as manager of quality assurance.
- Leo F. Tilly, recently sales manager of the Western Region for Lyon Metal Products, Inc., has been promoted to the post of general sales manager for the Aurora, Ill. firm. O. J. Henderson will succeed Tilly, transferring from duties as sales manager of the Eastern region.
- Charles J. Naulty has been appointed by Link-Belt Co. as sales manager for the Pacific Southern division, Montebello, Calif. Naulty has been with the firm since 1936 and in Los Angeles since 1946. He succeeds Benjamin Prestholt.
- O. Morgan Williams has been transferred by Shell Chemical Corp. from Dominguez, Calif., where he has been plant manager, to Denver, where he will have similar duties. E. M. Casagrande, plant manager at Martinez, Calif., succeeds Williams, and H. J. Thomas, assistant superintendent at the Martinez plant, will succeed Casagrande.
- Jack Wright has been appointed assistant manager; James Hardy, sales manager, and Jack Marinick, controller, of the Garrett Corporation's AiResearch Industrial Division.
- R. V. Walker has been appointed director of salvage and L. A. Oehrle director of freight claims by Pacific Intermountain Express. Walker, who joined the company in 1942, has directed freight claims for the last 15 years. Oehrle joined PIE in 1948 and since last February has been freight claims supervisor.

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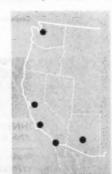
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